NUS CORPORATION
A Halliburton Company

FINAL DRAFT
PRELIMINARY ASSESSMENT
LI TUNGSTEN
GLEN COVE, NEW YORK

FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

NUS CORPORATION
SUPERFUND DIVISION

02-8907-28-PA
REV. NO. 1

FINAL DRAFT
PRELIMINARY ASSESSMENT
LI TUNGSTEN
GLEN COVE, NEW YORK

PREPARED UNDER
TECHNICAL DIRECTIVE DOCUMENT NO. 02-8907-28
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

SEPTEMBER 18, 1989
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NUS CORPORATION
SUPERFUND DIVISION

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103797

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

PART I: SITE INFORMATION

1. Site Name/Alias Li Tungsten/LI Tungsten/Wah Chang Smelting and Refining Company of America Inc.

   Street 63 Herb Hill Road

   City Glen Cove State New York Zip 11542

2. County Nassau County Code 059 Cong. Dist. 3

3 EPA ID No. NYD986882660

4. Latitude 40° 51′ 36″ N Longitude 73° 38′ 25″ W

   USGS Quad. Sea Cliff, New York

5. Owner Glen Cove Development Company Tel. No. Unavailable

   Street 34 Market Place

   City Baltimore State Maryland Zip 21202

6. Operator Li Tungsten Tel. No. (516) 676-1313

   Street 63 Herb Hill Road

   City Glen Cove State New York Zip 11542

7. Type of Ownership

   ☒ Private ☐ Federal ☐ State
   ☐ County ☐ Municipal ☐ Unknown ☐ Other ______

8. Owner/Operator Notification on File

   ☐ RCRA 3001 Date ______ ☐ CERCLA 103c Date ______
   ☒ None ☐ Unknown

9. Permit Information

Permit	Permit No.	Date Issued	Expiration Date	Comments
SPDES	NYD008249	Unknown	1987	Cooling water discharge

Radiation Source Material License	743-0464	3/19/64	Cancelled 1971	License to store, transport, and deliver radioactive compounds
Air Permit	Unknown	Unknown	Unknown	Air discharges from smelting operation

10. Site Status

☐ **Active** ☒ **Inactive** ☐ **Unknown**

11. Years of Operation 1941 **to** June 1985

12. Identify the types of waste units (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Management Areas

Waste Unit No.	Waste Unit Type	Facility Name for Unit
1	Drums	55- and 30-Gallon Drums
2	Piles	Waste Piles/Mounds
3	Crates	Wooden Crates
4	Tanks	Tanks
5	Surface Impoundments	Mud Pond/Mud Holes
6	Landfill	Landfill
7	Stained Soil	Stained Soil
8	Compressed Gas Cylinders	Gas Cylinders

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

There are seven other areas or items of concern at this site. First, there are 23 old electrical transformers scattered around the site which are suspected to contain polychlorinated biphenyl (PCB)-contaminated oil. The oil of three transformers has been analytically tested for the presence of PCBs and only one of the three tested positive. The second area is the analytical chemistry laboratories located in the Office and Labs Building. The ceiling of this building is falling down, as a result of which the contents of some reagent bottles and containers have spilled onto the floor, producing hazardous fumes within the building. Identifiable laboratory chemicals that exist in small quantities have been overpacked and secured. Small quantities of unidentified laboratory chemicals remain in certain areas. Also, the floors of the Dice and East Buildings are flooded with water. The third item of concern is asbestos. This material is found in siding shingles, roofing tiles, tank covers, and pipe wrapping. All of these items are in a state of decay and pieces of asbestos-containing materials have been found on the ground. The fourth item of concern is a radiation hazard. The facility smelted monazite sand and tungsten ore, which contain thorium-, radium- and uranium-bearing compounds, to produce tungsten products. These radioactive compounds are present in the crates, piles, drums, and landfill areas on the site. According to the EPA, a radiation survey was recently completed, but the results are not known. A previous radiation survey of the facility detected 64 to 251 nanocuries per gram (nCi/g) of radiation on the site, but no background radiation levels for comparison were given. The fifth area of concern is the oil recovery sump located to the west of the Dice Building and a small in-ground sump located in the northwest corner of the East Building. The latter sump contains low levels of vinyl chloride, trichloroethane, and 1,1,2-trichloroethane. The sixth area of concern is the three outfalls (003, 004, 005) from former wastewater treatment operations. These outfalls discharged into Glen Cove Creek; sediment samples collected in the vicinity of the outfalls contained elevated concentrations of nickel, chromium, lead, and tungsten. The seventh and last item of concern is a mercury spill on the floor of the Reduction Building. It has been proposed to clean up this spill by absorbtion with a lead-based salt.

Ref. Nos. 2, 3, 4, 8, 22, 25, 26, 28, 29

13. Information available from

Contact Amy Brochu **Agency** U.S. EPA **Tel. No.** (201) 906-6802

Preparer Steven Okulewicz **Agency** NUS Corp. Region 2 FIT **Date** 10/18/89

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 1 - Drums , 55- and 30-Gallon Drums

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   Li Tungsten has never had RCRA regulatory status and never applied for an EPA ID number. The company has held a New York State Pollutant Discharge Elimination System (SPDES) permit, an air permit, and a Radiation Source Material Licence from the Atomic Energy Commission for the use, storage, delivery, and transport of radioactive compounds which include monazite sand, raw tungsten ore, radium, thorium oxide, uranyl acetate, and thorium nitrate. The facility filed for bankruptcy and shut down in 1985. The age of the waste units is unknown.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The drums are scattered in small groups around the site. Some are buried in the landfill area, while others are stacked within or around the Dice Building, the New Warehouse, the north and south side of the Carbide Building, and at the southern corner of Herb Hill Road and Garvies Point Road.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   There are 3,749 55-gallon drums and 4,303 30-gallon drums that contain solid waste material. The total number of drums containing solid waste is 8,052. The quantity of waste material in some drums is unknown. Another 131 drums contain unidentified liquids.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   One hundred and one 55-gallon drums and thirty 30-gallon drums contain waste liquids, while the remaining drums (8,052) contain waste solids.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   Some drums contain raw and processed tungsten ores and residues, while others contain waste oil and hazardous liquids that include cyanide, nitric acid, hydrochloric acid, hydrofluoric acid, alkalis, carbon tetrachloride, and perchloroethylene. An unknown number of drums may contain heavy metal residues, including lead, chromium, cadmium, arsenic, tungsten, copper, nickel, zinc, barium, uranium, radium, and thorium.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The solid and liquid wastes are stored in many areas around the site. Some of the drums are overstacked, some have toppled, and some are badly corroded and leaking their contents upon the ground either within or around many buildings on the site. One hundred and eight drums containing acids, waste oil, and organics have been overpacked and/or staged to a secure area on the site. Some drums are buried within the landfill area and their condition and contents are unknown. Extensive sampling and analytical data have shown that waste materials are present in the soil and groundwater. There is a potential for waste contamination to enter groundwater, surface water, and the air.

Ref. Nos 1, 2, 3, 4, 5, 8, 25, 26, 28,

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 2 - Piles, Waste Piles/Mound

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   Li Tungsten has never had RCRA regulatory status and never applied for an EPA ID number. The company has held a New York State Pollutant Discharge Elimination System (SPDES) permit, an air permit, and a Radiation Source Material Licence from the Atomic Energy Commission for the use, storage, delivery, and transport of radioactive compounds which include monazite sand, raw tungsten ore, radium, thorium oxide, uranyl acetate, and thorium nitrate. The facility filed for bankruptcy and shut down in 1985. The age of the waste units is unknown.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   There are eight waste piles located on the site. Seven black waste piles are located around the natural pond in the landfill area between Herb Hill Road and The Place. One mound of waste is located behind and to the west of the Reduction Building.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The quantity of hazardous substances present in the seven waste piles is unknown; the total volume of these piles is estimated to be 325 cubic yards. The volume and the quantity of hazardous substances present in the waste mound are unknown.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical states of the waste suspected to be disposed of in the eight waste piles include solids, powders, and sludges.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The specific hazardous substances known to be present in the eight waste piles are the ores and residues/sludges from tungsten processing. These substances include lead, chromium, iron, barium, copper, manganese, zinc, and arsenic.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The waste piles and mound are in an open and uncovered, unpaved area; therefore, there is no containment. Extensive sampling and analytical data have shown that the waste materials on site are present in the soil and groundwater. There is a potential for these wastes to enter surface water and the air.

Ref. Nos. 1, 2, 3, 4, 5, 8, 25, 26, 28

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 3 - Crates , Wooden Crates

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   Li Tungsten has never had RCRA regulatory status and never applied for an EPA ID number. The company has held a New York SPDES permit, an air permit, and a Radiation Source Material Licence from the Atomic Energy Commission for the use, storage, delivery, and transport of radioactive compounds which include monazite sand, raw tungsten ore, radium, thorium oxide, uranyl acetate, and thorium nitrate. The facility filed for bankruptcy and shut down in 1985. The age of the waste units is unknown.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The wooden crates are found at various areas on site, but are located mainly within the New Warehouse Building, on the north side of the Carbide Building, and within the Dice Building/Warehouse.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   There are 719 wooden crates of unknown size and capacity on the site.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical state of the waste type as disposed of in the wooden crates is known to be a solid.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   Specific hazardous substances known to be present in the wooden crates are raw and processed tungsten ores; heavy metals including uranium, thorium, lead, cadmium, mercury, silver, chromium, arsenic, tungsten, zinc, nickel, and barium may also be present.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   Some of the wooden crates are located in an open and uncovered area on the outside of the buildings; they have been observed to be badly weathered or collapsed and spilling their contents upon the ground. Extensive sampling and analytical data have shown that the waste materials on site are present in the soil and groundwater. There is a potential for the wastes to enter surface water and the air.

Ref. Nos. 1, 2, 3, 4, 5, 8, 25, 26, 28

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 4 - Tanks, Tanks

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   Li Tungsten has never had RCRA regulatory status and never applied for an EPA ID number. The company has held a New York SPDES permit, an air permit, and a Radiation Source Material Licence from the Atomic Energy Commission for the use, storage, delivery, and transport of radioactive compounds which include monazite sand, raw tungsten ore, radium, thorium oxide, uranyl acetate, and thorium nitrate. The facility filed for bankruptcy and shut down in 1985. The age of the waste units is unknown.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The majority of the tanks are located in the Dice Building, the Warehouse Building, the East Building, the Loung Building, to the west of the Dice Building, at the southern end of the landfill area, and to the northwest of the Carbide Building. A large aboveground 500,000-gallon fuel tank is located to the north of the Mud Pond. There are also approximately eight underground tanks at unspecified locations.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   There are 224 tanks made of wood, metal, or fiberglass on site. The total capacity of these tanks is more than 2 million gallons, but at present they contain approximately 312,000 gallons of liquid. The aboveground No. 2 fuel oil tank has a capacity of 500,000 gallons.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   Sixty-four tanks contain approximately 312,000 gallons of identified liquids and residues. The contents of five tanks have been identified, although the quantity of material in them is unknown. Sixty-seven tanks contain an unknown quantity of unidentified materials. The remaining tanks (88) are empty, but are assumed to have once contained residues, sludges, and slurries. It is not known whether the 500,000-gallon No. 2 fuel oil tank currently contains any material.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The specific hazardous substances known to be present in the waste unit include ammonium tungstate, ammonium hydroxide, spent hydrochloric acid, hydrochloric acid, aqueous ammonia, sodium hydroxide, tungsten acid, calcium chloride, cobalt chloride solution, sodium tungstate solution, cobalt sulfate solution, No. 2 fuel oil, and other unidentified liquids, residues, and sludges that contain unspecified heavy metals. A tank truck containing anhydrous ammonia has been removed from the site.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The 224 tanks are found at numerous locations throughout the site. Some are contained within buildings, eight are underground, and others are located in open, uncovered areas aboveground. These tanks are of various sizes and are composed of wood, fiberglass, or metal. The physical condition of most of these tanks, including the underground tanks, is unknown. It is reported that many of the tanks are corroded or have collapsed linings. Fifty tanks have been an inspected externally for leaks and rupture. The contents of two tanks determined not to be secure have been sampled, drained, and drummed for disposal. The 500,000-gallon No. 2 fuel oil tank is leaking into the soil and groundwater, based upon extensive sampling and analytical data. Also, high concentrations of sulfate and chloride compounds have been detected in the groundwater. There is a potential for contaminant migration into the surface water and air.

Ref. Nos. 1, 2, 3, 4, 5, 8, 25, 26, 28

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 5 - Surface Impoundments , Mud Pond/Mud Hole

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   Li Tungsten has never had RCRA regulatory status and never applied for an EPA ID number. The company has held a New York SPDES permit, an air permit, and a Radiation Source Material Licence from the Atomic Energy Commission for the use, storage, delivery, and transport of radioactive compounds which include monazite sand, raw tungsten ore, radium, thorium oxide, uranyl acetate, and thorium nitrate. The facility filed for bankruptcy and shut down in 1985. The age of the waste units is unknown.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   Two settling ponds, referred to as a Mud Pond and a Mud Hole, exist on the site. Both are located immediately south of the 500,000-gallon fuel tank, along Garvies Point Road A natural pond is located south of the landfill area near the black waste piles, east of Dickson Lane.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The size of the Mud Pond and Mud Hole and the quantity of wastes in them are unknown. However, it is estimated that remediation of this area would require the removal of 5,000 cubic yards of material.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical states of the waste types as disposed of in the Mud Pond and Mud Hole may include sludges, fines, slurries, and liquids.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   Specific hazardous substances known to be present in the Mud Pond and Mud Hole are lead, chromium, cadmium, arsenic, tungsten, sulfate compounds, chloride compounds, and No. 2 fuel oil.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The Mud Pond was lined with a plastic liner, but has been leaking into the groundwater and surface soil, causing scarred vegetation The Mud Hole is an unlined pond. A plume of waste/process water which contains heavy metals has been detected emanating from under the Mud Pond. Extensive sampling and analytical data indicate the potential for contaminant migration into surface water

Ref. Nos. 1, 2, 3, 4, 5, 8

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 6 - Landfill, Landfill

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   Li Tungsten has never had RCRA regulatory status and never applied for an EPA ID number. The company has held a New York SPDES permit, an air permit, and a Radiation Source Material Licence from the Atomic Energy Commission for the use, storage, delivery, and transport of radioactive compounds which include monazite sand, raw tungsten ore, radium, thorium oxide, uranyl acetate, and thorium nitrate. The facility filed for bankruptcy and shut down in 1985. The age of the waste unit is unknown.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The landfill is located in an open, uncovered, partially wooded lot between the north side of Herb Hill Road and The Place. Most of the landfill area is located to the northern end of the lot closest to The Place.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The estimated volume of the landfill area is approximately 6,000 cubic yards. The actual quantity of hazardous waste within the landfill is unknown.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical state of the waste types as disposed of in the landfill area is unknown.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The specific hazardous substances suspected to be present in the landfill area are the residues from the tungsten ore extraction process. South of the landfill area there is an underground plume at a depth of greater than 20 feet that contains tetrachloroethene (PCE), 1,2-dichloroethane, and trichloroethene. However, these chemicals were never used on site and have been attributed to a former dry cleaning facility to the east of the landfill area.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The containment of the landfill is unknown; it is assumed that it was not lined. Buried drums of unknown structural integrity were reported to be present in this area. Therefore, the potential exists for contaminant migration into the groundwater, soil, surface water, and air.

Ref. Nos. 1, 2, 3, 4, 5, 8

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 7 - Stained Soil , Stained Soil

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   Li Tungsten has never had RCRA regulatory status and never obtained an EPA ID number. The company has held a New York SPDES permit, an air permit, and a Radiation Source Material Licence from the Atomic Energy Commission for the use, storage, delivery, and transport of radioactive compounds which include monazite sand, raw tungsten ore, thorium oxide, radium, uranyl acetate, and thorium nitrate. The facility filed for bankruptcy and shut down in 1985. The age of the waste unit is unknown.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The stained soil is located along the perimeter of the Mud Pond/Mud Hole area and extends under and beyond the wooden fence to the edge of Garvies Point Road. Stained soil also is found around the black waste piles along Dickson Lane.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The quantity of hazardous substances present within the stained soil areas is unknown. However, the volume of material to be removed from the Mud Pond/Mud Hole area is approximately 5,000 cubic yards.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical state of the waste types as disposed of in the stained soil areas include liquids, sludges, and fines.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The specific hazardous substances known to be present in the stained soil include chloride compounds, sulfate compounds, No. 2 fuel oil, and heavy metals such as lead, chromium, cadmium, arsenic, and tungsten.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   There is no containment associated with the stained soil, which also has an organic odor. The potential exists for contaminant migration into the surface water, groundwater, and air.

Ref. Nos. 1, 2, 3, 4, 5, 8

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 8 - Compressed Gas Cylinders , Gas Cylinders

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   Li Tungsten has never had RCRA regulatory status and never applied for an EPA ID number. The company has held a New York SPDES permit, an air permit, and a Radiation Source Material Licence from the Atomic Energy Commission for the use, storage, delivery, and transport of radioactive compounds which include monazite sand, raw tungsten ore, thorium oxide, radium, uranyl acetate, and thorium nitrate. The facility filed for bankruptcy and shut down in 1985. The compressed gas cylinders were removed fromthe site prior to 7/21/89. The age of the waste units is unknown.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The gas cylinders were located within the Office and Labs Building, south of Herb Hill Road.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   There were 22 gas cylinders of various sizes and capacities. The quantity of gas and liquids within these cylinders was unknown.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical state of the contents within the cylinders is gas or liquid.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The specific hazardous substances that were known to be present in the gas cylinders were hydrogen sulfide and chlorine. Sulfur dioxide and anhydrous ammonia were also suspected to be present in the gas cylinders.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The hazardous substances were contained within metal compressed gas cylinders. These cylinders were not corroded or in any danger of leaking and have been removed from the site. Therefore, there was little or no potential for contaminants from the cylinders to enter the surface water, groundwater, or air.

Ref. Nos. 1, 2, 3, 4, 5, 8, 25

PART III: HAZARD ASSESSMENT

GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

Contaminants in the groundwater attributable to the facility were analytically identified from monitoring well samples. These contaminants include cobalt, nickel, molybdenum, cadmium, tungsten, lead, arsenic, chromium, silver, and barium, as well as chloride and sulfate compounds. Four different plumes of chemicals were found in the groundwater on the site. Two plumes contain volatile organic chemicals derived from adjacent areas and are not attributed to Li Tungsten. A plume of No. 2 fuel oil from the aboveground storage tank was evidenced by the presence of petroleum hydrocarbons in nearby monitoring wells. The last underground plume occurs below the Mud Pond which has been leaking waste/process water solutions. The plume contains sulfate compounds and elevated concentrations of lead, chromium, cadmium, tungsten, and arsenic.

Ref. Nos. 4 (Volume 1, Part 1, pp. 1-4 to 1-6; Part 4, pp. 17-21), 21, 22

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

In the vicinity of the facility, two aquifers have been identified. From the surface downward, they are the Upper Glacial Aquifer and the Lloyd Aquifer. The Magothy Aquifer is not present in the immediate vicinity of the site. The Upper Glacial Aquifer occurs at a depth of 0 to 175 feet under Li Tungsten and consists of highly permeable Pleistocene and Holocene deposits of fine to coarse, stratified quartzose sand and gravel. It also contains thin interbeds of silt and clay.

The Upper Glacial Aquifer rests unconformably upon the Clay Member of the Raritan Formation of Cretaceous Age. The Raritan Clay (Raritan Confining Unit) ranges in thickness from 0 to 200 feet and can be found at depths ranging from 150 to 250 feet below the surface under Li Tungsten. This clay member consists mainly of light to dark grey, red, white, or yellow clay with variable amounts of silt and silty fine sand. Due to the heterogeneity of sediments within the clay member, the permeability is variable.

Below the Raritan Clay lies the Lloyd Sand Aquifer of early Cretaceous Age. It can be found at depths from 200 to 400 feet below the surface and is approximately 200 feet thick. The Lloyd Sand consists of discontinuous layers of silt, clay, sandy clay, sand, and gravel with a variable permeability.

Beneath the Lloyd Sand is crystalline bedrock composed of schist and gneiss. The total thickness of the overlying, unconsolidated sedimentary deposits in this area is greater than 400 feet. Groundwater in the Upper Glacial Aquifer flows south-southwest toward Glen Cove Creek, while in the Lloyd Sand Aquifer, it flows from north to south. Due to the heterogeneity of the Raritan Clay Member, interconnections are presumed to exist between the Upper Glacial and the Lloyd Aquifers. Groundwater in the Upper Glacial Aquifer occurs at 0 to 45 feet below the surface; the average depth of water within the monitoring wells is approximately 8 feet below the surface.

These aquifers contain the water tapped by many public supply wells for the area and have been designated as a "sole source aquifer" by the U.S. EPA. The permeability of this unit is estimated to be greater than 10^{-3} cm/sec.

Ref. Nos. 4 (Volume 1, Part 4, pp. 14-17), 12, 24

3. **Is a designated sole source aquifer within 3 miles of the site?**

   A sole source aquifer has been designated within 3 miles of the site.

   Ref. Nos. 10, 12, 24

4. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

   The lowest points of waste disposal/storage are the underground tanks and the landfill, the depth of neither of which is known. Therefore, a depth of 6 feet will be assumed. The depth to the water table in the vicinity of the landfill is approximately 14 feet. The depth from the lowest point of waste disposal to the highest seasonal level of the aquifer of concern is therefore assumed to be 8 feet.

   Ref. No. 4

5. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?**

   The permeability value of the least permeable continuous intervening stratum between the ground surface and the Upper Glacial Aquifer is greater than 10^{-3} cm/sec.

   Ref. Nos. 12, 14

6. **What is the net annual precipitation for the area?**

   The net annual precipitation for this area, based upon the normal annual total precipitation minus the mean annual lake evaporation, is approximately 16 inches.

   Ref. No. 14

7. **Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).**

   Groundwater within 3 miles of the site is used for public supply wells, private drinking sources, and commercial, industrial, and irrigation applications. Many wells have been closed or have restricted use due to volatile organic chemical contamination from undetermined sources.

   Ref. Nos. 12, 13, 15

8. **What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?**

   Distance 4400 feet **Depth** 614 feet

   Ref. Nos. 6, 12, 13

9. **Identify the population served by the aquifer of concern within a 3-mile radius of the site.**

   The population served by the aquifer of concern is approximately 161,100.

   Ref. Nos. 9, 16

SURFACE WATER ROUTE

10. **Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility.**

A potential exists for a release of contaminants to Glen Cove Creek. The leaking Mud Hole, Mud Pond, and oil tank are located across the street (Garvies Point Road) from Glen Cove Creek. Chemicals identified from surface soil and water samples around these leaking sections include arsenic, selenium, silver, barium, cobalt, chromium, copper, iron, manganese, nickel, strontium, vanadium, zinc, lead, antimony, thallium, aluminum, tungsten, cadmium, titanium, and molybdenum.

Ref. Nos. 1, 4 (Volume 1, Part 1, pp.1-14 to 1-15), 21, 22

11. **Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.**

The nearest downslope surface water is Glen Cove Creek, which flows southwest and is adjacent to the south property boundary. This creek then flows into Hempstead Harbor and Long Island Sound.

Ref. No. 6

12. **What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected.)**

The facility slope, as measured from the northern boundary of the landfill to outfall No. 005, is 4.0 percent.

Ref. Nos. 4, 5, 6, 22

13. **What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water.)**

The slope of the intervening terrain, as measured from outfall No. 005 to Glen Cove Creek, is approximately 33 percent.

Ref. Nos. 4, 5, 6, 22

14. **What is the 1-year 24-hour rainfall?**

The 1-year 24-hour rainfall for this area is approximately 2.7 inches.

Ref. No. 14

15. **What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.**

The distance from outfall No. 005 to Glen Cove Creek is approximately 30 feet.

Ref. Nos. 4, 5, 6, 22

16. Identify uses of surface waters within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used).

Surface water uses within 3 miles downstream of the site include recreational and commercial.

Ref. Nos. 6, 20

17. Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.

Not applicable; there are no wetlands greater than 5 acres in area within 2 miles downstream of the site.

Ref. No. 20

18. Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.

There are no known critical habitats of federally listed endangered species within 2 miles downstream of the site. However, Hempstead Harbor is a waterfowl wintering area most noted for scaup, canvasback, and black ducks, and is a nursery/feeding habitat for striped bass, bluefish, Atlantic silverside, menhaden, winter flounder, and blackfish. Hempstead Harbor has been designated as a "significant coastal fish and wildlife habitat" by the NYS Department of State under Policy 7 of the Waterfront Revitalization and Coastal Resources Act of 1981.

Ref. Nos. 7, 20, 23, 25

19. What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?

No sensitive environments have been identified along Glen Cove Creek or Hempstead Harbor within 2 miles.

Ref. Nos. 7, 20, 23, 25

20. Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).

Not applicable. There are no crops irrigated by surface water intakes within 3 miles downstream of the site.

Ref. Nos. 6, 11

21. What is the state water quality classification of the water body of concern?

The state water quality classification for Hempstead Harbor north of Bar Beach is Class SA (suitable for shell fishing for market purposes and primary/secondary recreation). The state water quality classification for Glen Cove Creek is Class I (secondary contact recreation except for primary recreation and shell fishing).

Ref. No. 18

22. Describe any apparent biota contamination that is attributable to the site.

Biota contamination attributable to the site exists along the grassy area around the Mud Pond, Mud Hole, and waste piles. Data on contamination of biota within Glen Cove Creek is unavailable at this time.

Ref. Nos. 4, 5, 8

AIR ROUTE

23. Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.

There is a potential for release of contaminants to the air. Tank covers, siding shingles, roofing tiles, and pipe wrapping, all of which are known to contain asbestos, are in a state of decay. Analyses of indoor and outdoor air samples from the site indicate the presence of little or no volatile organic chemicals and airborne metals; analyses also indicate little or no airborne asbestos particulates. Larger tanks containing aqueous ammonia, hydrochloric acid, and tungsten acid are in an unknown condition and could potentially leak. Also, within the Laboratory Building, the contents of several drums and containers have spilled onto the floor and are producing hazardous vapors.

Ref. Nos. 4 (Volume 1, Part 1, pp. 1-6; Volume 2, Part 6), 8, 25, 26, 27, 28

24. What is the population within a 4-mile radius of the site?

The population within a 4-mile radius of the site is approximately 67,900.

Ref. No. 17

FIRE AND EXPLOSION

25. Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.

There is a potential for fire or explosion to occur with respect to the hazardous substances known to be present on the site. The hazardous vapors within the laboratory pose a serious threat of fire or explosion.

Ref. Nos. 4 (Volume 2, Part 6), 8, 25, 26, 28

26. What is the population within a 2-mile radius of the hazardous substance(s) at the facility?

The population within a 2-mile radius of the hazardous substances at the facility is approximately 35,400.

Ref. No. 17

DIRECT CONTACT/ON-SITE EXPOSURE

27. Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.

There is a potential for direct contact with hazardous substances stored in the waste units at the southeast corner of Herb Hill and Garvies Point Roads, and along the southern portion of Garvies Point Road across from the Hawkins Fuel Oil Company. At the corner there are stacked 30-gallon drums of unknown contents. Although these drums are behind a wooden fence, they are stacked higher than the fence and could topple onto the sidewalk. Along Garvies Point Road, the Mud Pond and Mud Hole and fuel oil tank have scarred and blackened the grass and the base of the trees. This scarring can be found from the aforementioned area to the edge of the roadway. The remainder of the site is fenced off from public access with wooden and chain-link fences. The site is also surrounded by yellow caution tape and patrolled by a private security force.

Ref. Nos. 5, 8, 25

28. How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?

There are no residents who live on a property whose boundaries encompass any part of an area contaminated by the site.

Ref. No. 5

29. What is the population within a 1-mile radius of the site?

The population within a 1-mile radius of the site is approximately 9,900.

Ref. No. 17

PART IV: SITE SUMMARY AND RECOMMENDATIONS

Li Tungsten is located in an industrial area on approximately 26 acres along the north bank of Glen Cove Creek in the city of Glen Cove, Nassau County, New York. From the 1940s to the early 1980s, tungsten ores imported from Mainland China were smelted at this facility for the making of tungsten carbide powder, tungsten wire and welding rods. In 1985, the company filed for bankruptcy; the property is presently owned by the Glen Cove Development Company.

Although the site is presently inactive, most of the wastes generated by the facility remain on site. These wastes include 17,000 tons of solid residue/ore materials in piles, in a landfill, in wooden crates, and in 30- and 55-gallon drums. Some of the drums are overstacked and some have toppled and have broken open, spilling their contents upon the ground. One hundred and eight drums containing acids, waste oil, and organics have been overpaked and/or staged to a secure area on site. The remaining unsound drums are also recommended for overpacking to eliminate the potential for a release of their contents. Elsewhere on the site, there are approximately 312,000 gallons of various liquids stored in 224 above- and below- ground tanks of unknown physical condition, some of which contain hazardous organic and inorganic liquids. The inorganic liquids include spent or unused hydrochloric acid and aqueous ammonia. Fifty tanks have been inspected for leaks and rupture. Two tanks were determined not to be secure and have been drained and/drummed for disposal. An analytical laboratory contains reagents that are known to be spilled or leaking. Small quantities of identifiable chemicals have been overpacked and secured, while small quantities of unidentified chemicals remain in some areas. There are also 23 electrical transformers on site that potentially contain PCB-contaminated oil.

Removal activities have already begun with respect to some of the surficial containers and the contents of some of the tanks. A site investigation conducted by a consulting firm was completed in May of 1988, during which samples were taken from 10 existing groundwater monitoring wells and 13 more monitoring wells were installed. Analyses of samples from these wells identified four underground plumes within the groundwater of the Upper Glacial Aquifer. One plume occurs at a depth of approximately 20 feet along the eastern boundary of the site and was found to contain several dry cleaning solvents related to tetrachloroethylene. The plume is believed to originate from a dry cleaning facility that formerly occupied the property adjacent to the site. Another plume was found along the western boundary of the site and was traced to an adjacent property formerly occupied by a petrochemical company. Both plumes are moving south towards Glen Cove Creek. Another plume occurs in the vicinity of a leaking 500,000-gallon No. 2 fuel oil tank north of Garvies Point Road. The last plume is located around the Mud Pond, which contains waste processing water

PART IV: SITE SUMMARY AND RECOMMENDATIONS (CONT'D)

and heavy metals. Chloride and sulfate compounds, and concentrations of lead, cadmium, tungsten, chromium, arsenic, barium, and silver have been detected in samples collected from this area. The materials leaking from the tank and the pond have also scarred the surface in this area. Asbestos fibers from decaying tank covers and pipe wrapping materials are known to be present on the grounds. Similarly, waste piles containing raw and processed tungsten ores are known to contain radioactive radium, uranium, and thorium compounds used in the ore refining process. The United States Environmental Protection Agency issued an Administrative Order on Consent to the Glen Cove Development Company on 7/21/89, outlining initial actions to be taken at the site. The site is scheduled for a cleanup of hazardous wastes including, but not limited to, the removal of drums, the contents of the tanks, laboratory chemicals, and electrical transformers by May 1990, but plans for cleanup of the groundwater and soil have not been finalized. Development as a residential area is planned for the site. Based upon the high target population potentially affected by groundwater contamination and the potential for direct contact with some of the wastes on site, the Li Tungsten site is recommended for a **HIGH PRIORITY** site inspection.

Soil samples should be collected from all known and suspected areas of surficial contamination and analyzed for Target Compound List (TCL) contaminants and screened for radioactivity. These areas include the landfill and waste piles north of Herb Hill Road, the mound located west of the Reduction Building, the corner of Garvies Point Road where the Mud Pond is located, and the areas where outdoor drums and crates are found. Samples collected from the area of suspected fuel oil contamination, north of the Mud Pond along Garvies Point Road, should be analyzed for petroleum hydrocarbons. Surface water and sediment samples should be collected from the on-site surface impoundments, the three outfalls, and from Glen Cove Creek upstream and downstream of the site. These samples should also be analyzed for TCL contaminants and screened for radioactivity. Samples should also be collected from all groundwater monitoring wells and analyzed for TCL contaminants. Well water samples collected in the vicinity of the fuel oil tank and the sump west of the Dice Building should also be analyzed for petroleum hydrocarbons. Continuous air monitoring is recommended to determine the presence of asbestos particulates and inorganic hazardous vapors during the site inspection and/or remedial activities.

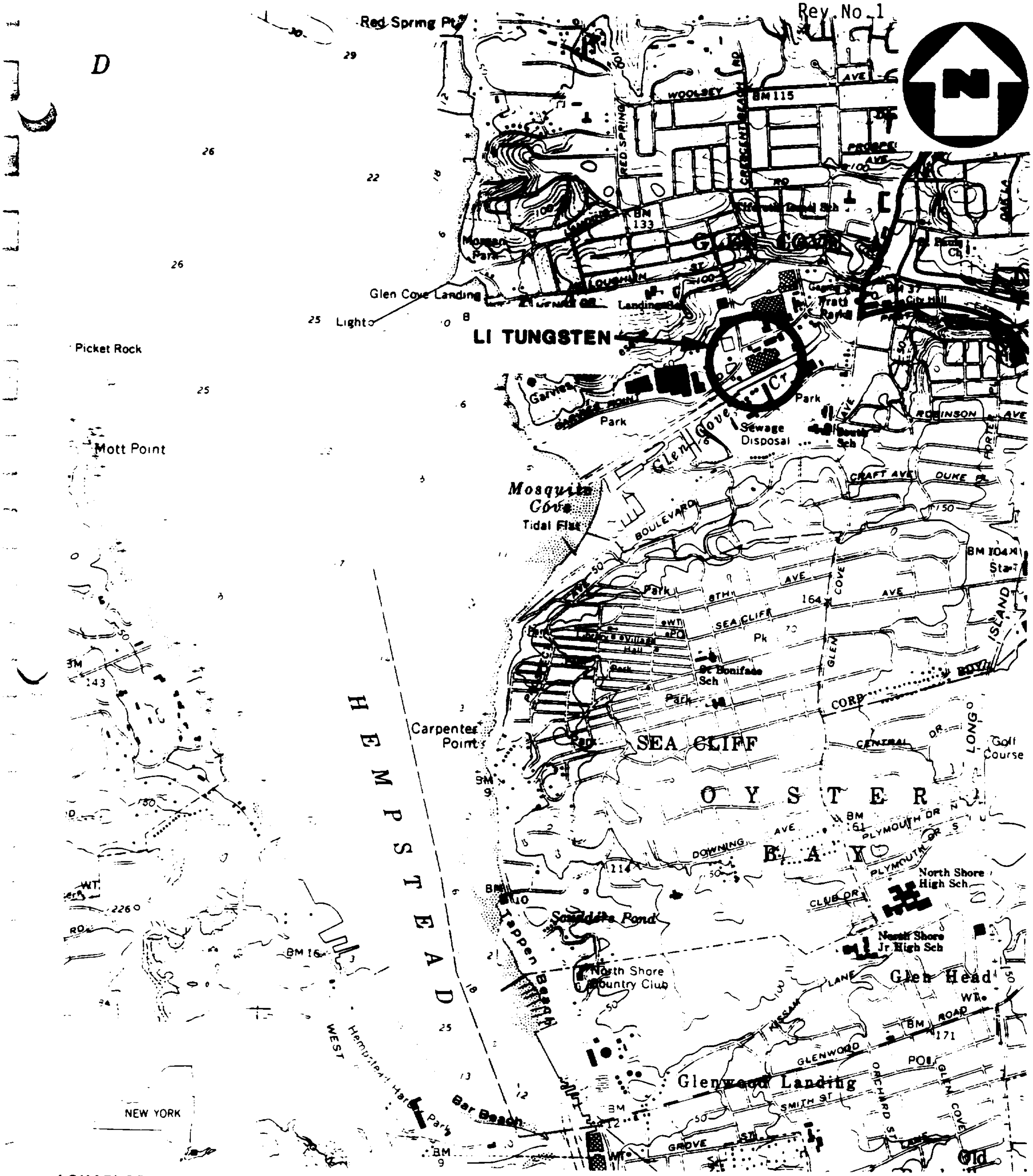
ATTACHMENT 1

02-8907-28-PA
Rev. No. 1

LI TUNGSTEN
GLEN COVE, NASSAU COUNTY, NEW YORK

CONTENTS

02-8907-28-PA
Rev. No. 1



(QUAD) SEA CLIFF, N.Y.

SITE LOCATION MAP

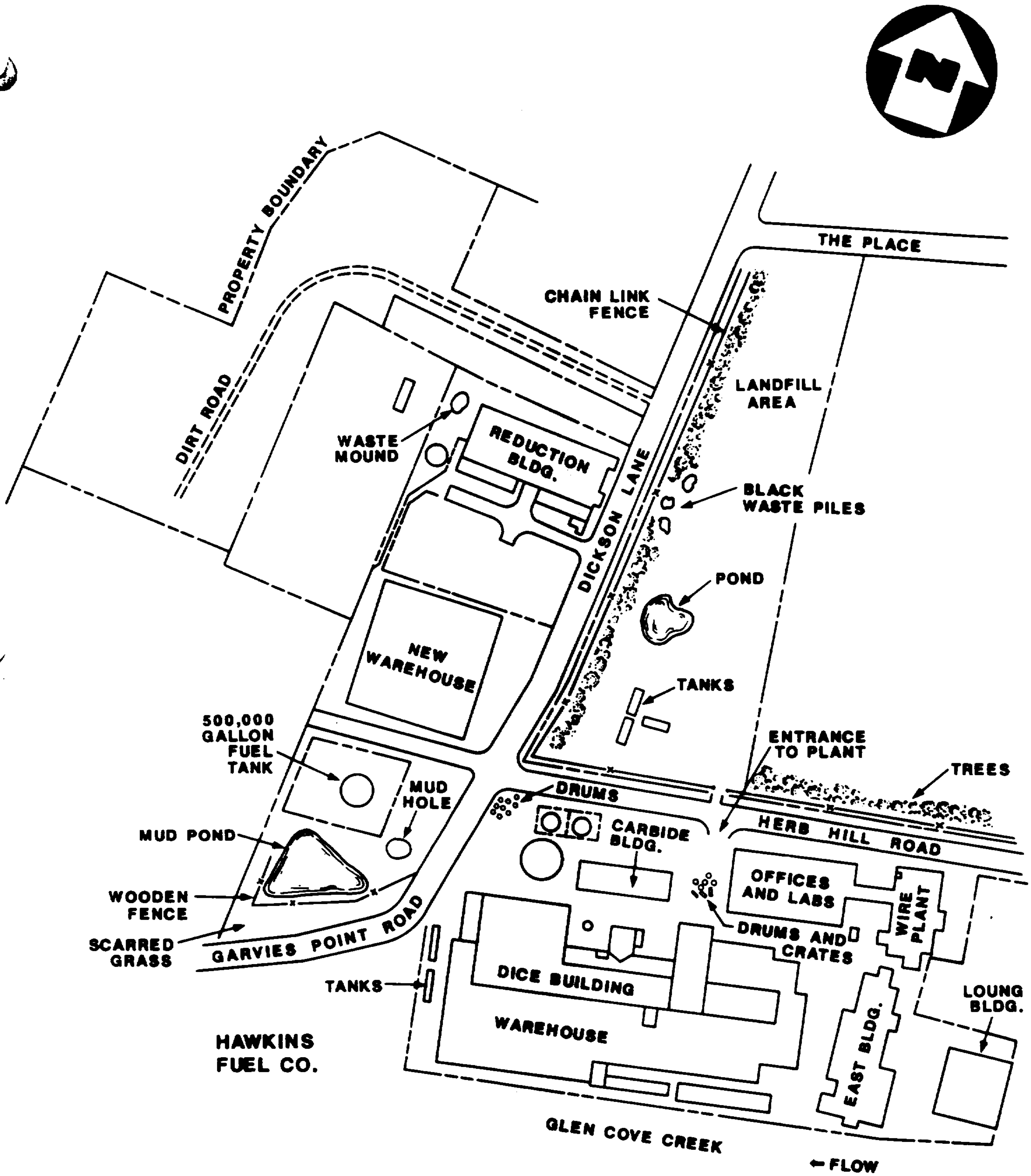
LI TUNGSTEN, GLEN COVE, N.Y.

SCALE: 1" = 2000'

FIGURE 1

NUS CORPORATION

02-8907-28-PA
Rev.No.1



103821

FIGURE 2

SITE MAP

LI TUNGSTEN, GLEN COVE, LONG ISLAND, N.Y.

NOT TO SCALE

NUS CORPORATION

Exhibit A

Photograph Log

LI TUNGSTEN

GLEN COVE, NASSAU COUNTY, NEW YORK

JULY 20, 1989

LI TUNGSTEN

GLEN COVE, NASSAU COUNTY, NEW YORK
JULY 20, 1989

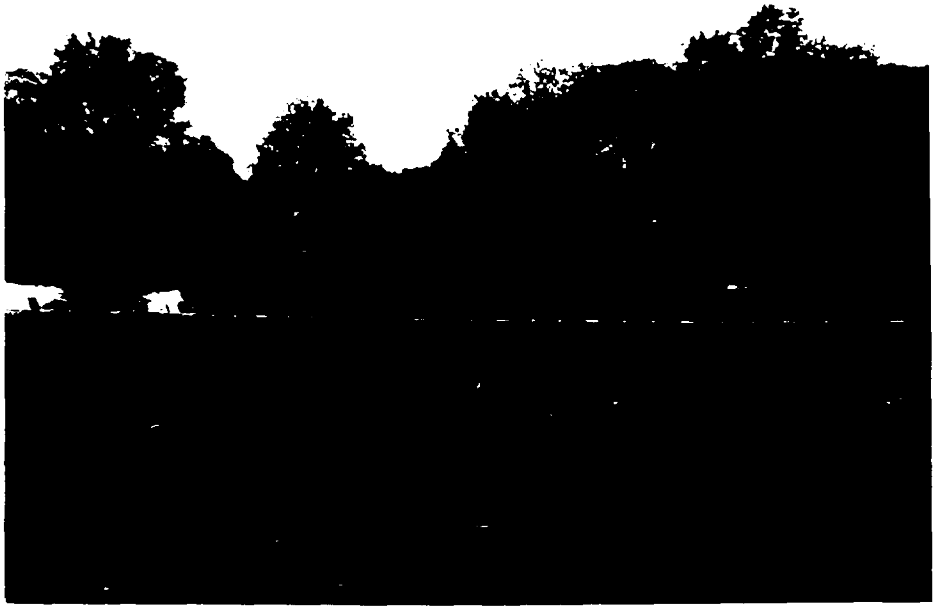
PHOTOGRAPH INDEX

ALL PHOTOGRAPHS TAKEN BY DEBORAH COHEN

Photo Number	Description	Time
1P-1	Aboveground tanks along Herb Hill Road, looking north.	1205
1P-2	South view of main entrance to site.	1209
1P-3	South view of main entrance to site showing stacked drums and wooden pallets.	1210
1P-4	North view along Garvies Point Road showing scarred vegetation, fuel oil tank, and monitoring well.	1220
1P-5	Southeast view of Hawkins Fuel Oil Company and the Warehouse Building.	1221
1P-6	East view of monitoring well GM-8 along Herb Hill Road near surface storage tanks.	1230
1P-7	Entrance to New Warehouse Building showing open door and 55-gallon drum.	1231
1P-8	Stacked, grey 30-gallon drums on the corner of Herb Hill Road and Dickson Lane.	1232
1P-9	Entrance to Reduction Building showing storage tank and 55-gallon drums.	1223
1P-10	Black waste piles on Dickson Lane looking east.	1240

NUS CORPORATION

LI TUNGSTEN
GLEN COVE, NASSAU COUNTY, NEW YORK



IP-1 1205

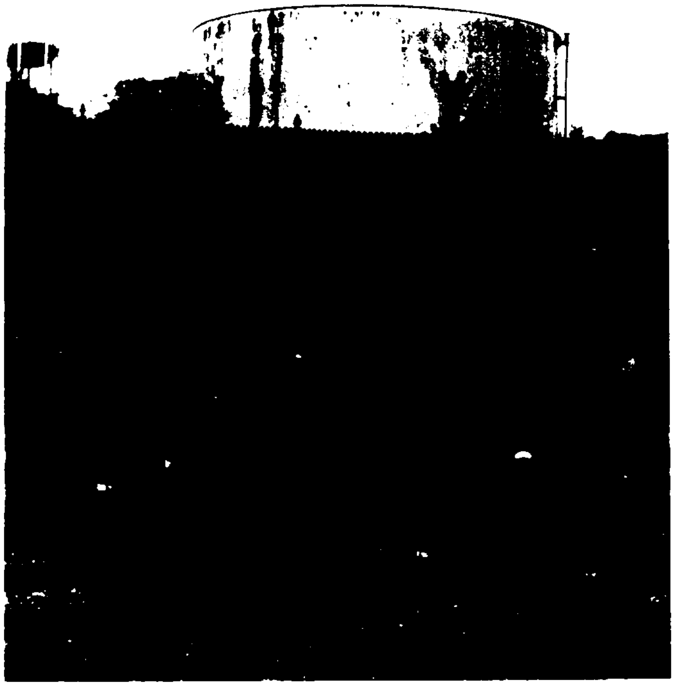
Aboveground tanks along Herb Hill Road, looking north.
July 20, 1989

IP-2 1209

South view of main entrance to site.
July 20, 1989

NUS CORPORATION

LI TUNGSTEN
GLEN COVE, NASSAU COUNTY, NEW YORK



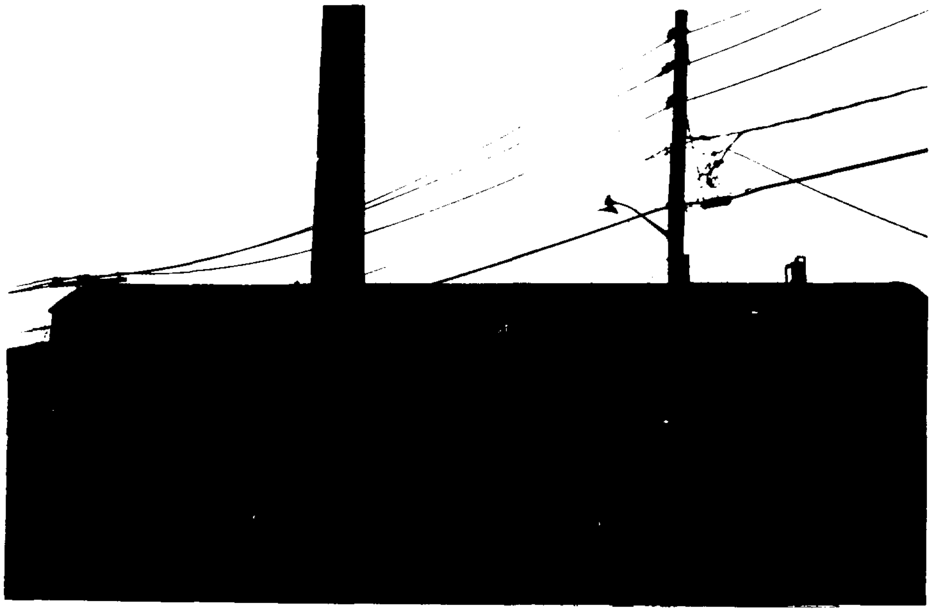
1P-4 North view along Garvies Point Road showing scarred vegetation, fuel oil tank, and monitoring well. 1220

1P-3 South view of main site entrance showing stacked drums and wooden pallets. Both photos taken July 20, 1989. 1210

103825

NUS CORPORATION

LI TUNGSTEN
GLEN COVE, NASSAU COUNTY, NEW YORK



1P-5 1221

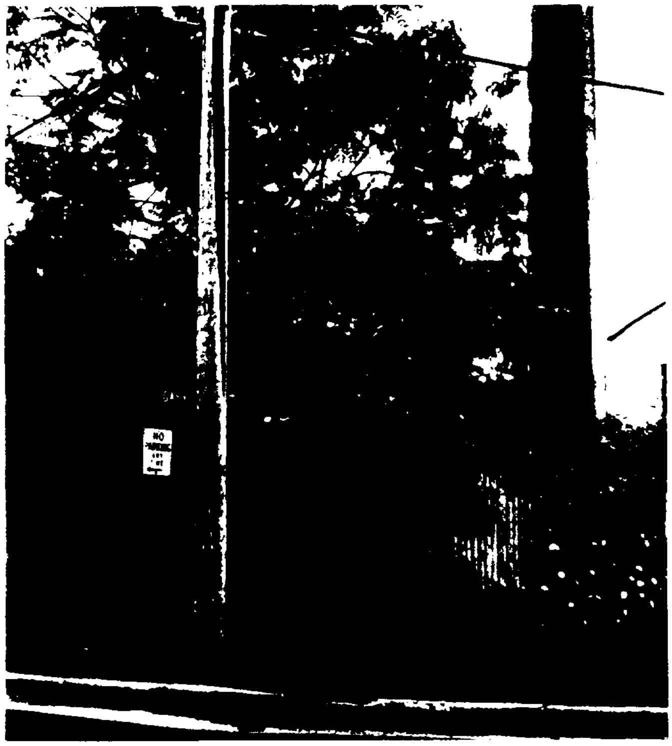
Southeast view of Hawkins Fuel Oil Company and the Warehouse Building. July 20, 1989

1P-6 1230

East view of monitoring well GM-8 along Herb Hill Road near surface storage tanks. July 20, 1989

NUS CORPORATION

LI TUNGSTEN
GLEN COVE, NASSAU COUNTY, NEW YORK



1P-8 1232

Stacked, grey 30-gallon drums on the corner of Herb Hill Road and Dickson Lane. July 20, 1989

1P-7 1231

Entrance to the New Warehouse Building showing open door and 55-gallon drum. July 20, 1989

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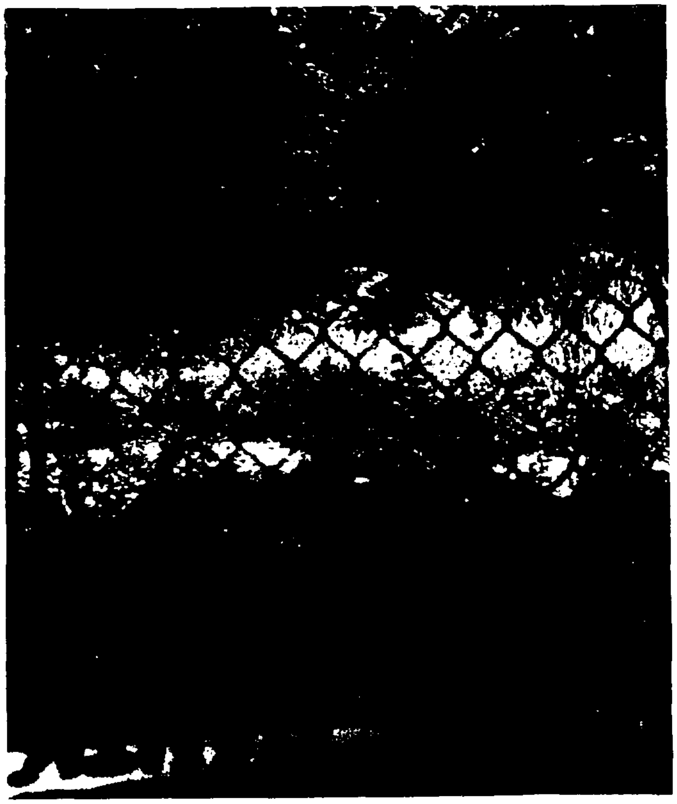
LI TUNGSTEN
GLEN COVE, NASSAU COUNTY, NEW YORK



1P-10 Black waste piles on Dickson Lane looking east 1240
July 20,1989

1P-9 1223
Entrance to Reduction Building showing storage tank and 55-gallon drums. July 20, 1989

103828

ATTACHMENT 2

REFERENCES

1. Letter from Robert A. Becherer, Regional Hazardous Substances Engineer, New York State Department of Environmental Conservation, to Charles Fitzsimmons, U.S. EPA, Edison, NJ, 5/9/89.

2. Letter from John A. Miele, Associate Radiophysicist, Licensing Section, NYS Department of Labor, Division of Industrial Hygiene, to F.H. Lee, Radiation Safety Officer, Wah Chang Smelting and Refining Company of America, Inc., 11/30/71.

3. Telecon Note: Conversation between Charles Fitzsimmons, U.S. EPA, Edison, NJ, and Steven Okulewicz, NUS Corp. Region 2 FIT, 7/31/89.

4. Li Tungsten Site Investigation Report, Volumes 1 and 2, RTP Environmental Associates Inc., May 1988.

5. Preliminary Assessment Off-Site Reconnaissance Information Reporting Form, Li Tungsten, TDD No. 02-8907-28, NUS Corp. Region 2 FIT, Edison, NJ, 7/20/89.

6. Three-Mile Vicinity Map, compiled from U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5 minute series, Sea Cliff, NY, 1968, photorevised 1979; Bayville, NY-Conn., 1967; Mammaroneck, NY-Conn., 1967; Hicksville, NY 1967, photorevised 1979.

7. U.S. Department of the Interior, Fish and Wildlife Service, Atlantic Coast Ecological Inventory, NY-Conn.-NJ, 1980.

8. Waste Characterization Report - Li Tungsten Site, Glen Cove, New York, Volume 1, Enviropact Northeast, Inc. 4/29/88.

9. New York State Atlas of Community Water System Sources, NYS Department of Health, Division of Environmental Protection, Bureau of Public Water Supply Protection, 1982.

10. Monthly fluctuations in the quality of ground water near the water table in Nassau and Suffolk Counties, Long Island, New York. U.S. Geological Survey Water Resources Investigations 78-41, 1978.

11. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Nassau County, NY, 1985.

12. Hydrogeology and ground-water quality of the northern part of the town of Oyster Bay, Nassau County, New York, in 1980. U.S. Geological Survey Water Resources Investigations, Report 85-4051, 1985.

13. List of wells within 3 miles of Li Tungsten, compiled from Tables 4 and 5 from Reference No. 12.

14. Uncontrolled hazardous waste site ranking system, A user's manual, 40 CFR, Part 300, Appendix A, 1986.

15. Telecon Note: Conversation between Don Myott, Nassau County Department of Health, Bureau of Public Water Supply, and Brian Dietz, NUS Corp. Edison, NJ, 3/29/89.

16. Nassau County Planning Commission, Water Supply and Water Districts Map 10/84.

17. General Sciences Corporation, Graphical Exposure Modeling System (GEMS). Landover, Maryland, 1986

REFERENCES (Cont'd)

18. Telecon Note: Conversation between Jim Gilmore, New York State Department of Environmental Conservation, and Steve Okulewicz, NUS Corp., Edison, NJ, 8/7/89.

19. Telecon Note: Conversation between Debra Rothberg, Jones, Day, Revis, and Pogue Law Office, and Steve Okulewicz, NUS Corp., Edison, NJ, 8/4/89.

20. Telecon Note: Conversation between Jim Gilmore, New York State Department of Environmental Conservation, and Steve Okulewicz, NUS Corp, Edison, NJ, 8/8/89.

21. Letter from Agnes Gara, Assistant Sanitary Engineer, NY State Department of Health, to Robert J. Mangan, Director of Public Works, Glen Cove NY. 9/28/87.

22. NYSDEC memorandum from R.A. Becherer to Li Tungsten File, Subject: Analytical Data. 7/15/86.

23. Letter from John W. Ozard, Senior Wildlife Biologist, NYSDEC Wildlife Resources Center, to David J. Grupp, NUS Corp., Edison, NJ. 4/10/87

24. Federal Register/Volume 49, Number 16/Tuesday, January 24, 1984. Aquifers underlying Kings and Queens Counties, New York Determination.

25. U.S. EPA Region II, Administrative Order on Consent, Index No. II CERCLA-90215, In the Matter of Li Tungsten Site, 7/21/89.

26. Letter and laboratory reports from James A. Perazzo, Associate-Manager of Geosciences, Fred C. Hart Associates, to Charles Fitzsimmons, Environmental Engineer, U.S. EPA Region II, 9/21/89.

27. Telecon Note: Conversation between Charles Fitzsimmons, U.S. EPA, Edison, NJ, and Steven Okulewicz, NUS Corp. Region 2 FIT, 10/3/89.

28. Laboratory report, Nytest Environmental Inc., Li Tungsten, 9/21/89.

29. Telecon Note: Conversation between Robert Thessifeld, Nassau County Department of Health, and Steven Okulewicz, NUS Corp. Region 2 FIT, 10/23/89

REFERENCE NO. 1

New York State Department of Environmental Conservation
Building 40—SUNY, Stony Brook, New York 11794

(516) 751-2617

Thomas C. Jorling
Commissioner

May 9, 1989

Mr. Charles Fitzsimmons
USEPA
Woodbridge Avenue
Edison, NJ 08837

MC:MS211

Re: Li Tungsten
Glen Cove, NY

Dear Mr. Fitzsimmons:

As per our telephone conversation, attached are data pertaining to the Li Tungsten site, Glen Cove, from our files. The following information pertains to the regulatory status of the site:

1. The facility had a New York State Discharge Permit (SPDES) NYD 008249. I was not able to obtain a copy of the permit, but this can be pursued if necessary. I am attaching copies of the company's discharge monitoring report.

2. The facility never had RCRA regulatory status. The company never obtained an EPA ID number. In spite of this fact, the Department inspected the facility in December, 1985. The inspection did not indicate that any hazardous waste was being generated from the facility operation. A copy of the salient portions of the inspection is attached.

3. The RCRA inspection report indicates the facility had an Air Permit. Since the Nassau County Health Department (NCHD) administers the air program for DEC in Nassau County, I suggest you contact the NCHD if you would like information on their Air Permit.

Mr. Charles Fitzsimmons 2.
USEPA
Re: Li Tungsten, Glen Cove, NY

Samples of materials on site and soil samples have been taken and analyzed over the past few years. Copies of the sampling results are enclosed.

I hope you will find this information useful in your work at the site.

Very truly yours,

Robert A. Becherer

Robert A. Becherer, P.E.
Regional Hazardous Substances
Engineer

RAB:mz
cc: G. Bratner
T. Candela

103834

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES — DISCHARGE MONITORING REPORT

SEE THE REVERSE SIDE OF PART 4 FOR INSTRUCTIONS

...UNTY	DATE PRODUCED	PAGE
...H NASSAU	07-02-82	1 of 2

...249 — REPORT PERIOD 07-01-82 THRU 07-31-82 — 1

...PARAMETER/UNITS	OUTFALL	MONITORING LOCATION		MINIMUM	AVERAGE	MAXIMUM	# EX.	TYPE	FREQUENCY
...VY NET	005	EFFLUENT VALUE 0100055050301	LIMIT	MONITORING	REQUIRED	NO LIMITS		METERED	CONTINUOUS
			REPORTED VALUE		0.088				
	004	EFFLUENT VALUE 0200056050401	LIMIT	MONITORING	REQUIRED-	NO LIMITS		METERED	INSTANT
			REPORTED VALUE		0.010				
	005	EFFLUENT VALUE 0300055050501	LIMIT	MONITORING	REQUIRED-	NO LIMITS		METERED	INSTANT
			REPORTED VALUE		0.020				
...TURE	003	EFFLUENT VALUE 0400010030301	LIMIT	*********	*********	90.0000		METERED	CONTINUOUS
			REPORTED VALUE	*********	*********	69	0		
...TURE	005	EFFLUENT VALUE 0500010030501	LIMIT	*********	*********	90.0000		GRAB	MONTHLY
			REPORTED VALUE	*********	*********	66	0		
	003	EFFLUENT VALUE 0600400120301	LIMIT	5.0000	*********	9.0000		GRAB	MONTHLY
			REPORTED VALUE	6.8	*********	6.8	0		
	004	EFFLUENT VALUE 0700400120401	LIMIT	5.0000	*********	10.0000		GRAB	CONTINUOUS
			REPORTED VALUE	6.9	*********	7.5	0		
	005	EFFLUENT VALUE 0800400120501	LIMIT	5.0000	*********	9.0000		GRAB	MONTHLY
			REPORTED VALUE	6.5	*********	6.5	0		
...(AS NH3)	004	EFFLUENT VALUE 0900610020401	LIMIT	*********	29.2000	58.4000		24 HR COMP	2/MONTH
			REPORTED VALUE	*********	0.10	0.23	0		
...-NO3	004	EFFLUENT VALUE 1000740020401	LIMIT	*********	11.3000	23.6000		24 HR COMP	2/MONTH
			REPORTED VALUE	*********	0.04	0.04	0		

...eby affirm under penalty of perjury that information provided on this form is true to the best of my ...ge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to ...10.45 of the Penal Law.

...NAME AND TITLE

...arles Gow Vice President 8/25/82

[X] 1 PERMITTEE
[ ] 2 AGENT

Charles C. Gow

DATE 8/25/82

LI TUNGSTEN CORP
63 HERB HILL ROAD
GLEN COVE NY 11542

NY0008249
04 NPI 02
35 17 SUB 02 SH 0...

RECEIVED
AUG 26 1982

PART 1—ENCON COPY

103835

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES — DISCHARGE MONITORING REPORT

SEE THE REVERSE SIDE OF PART 4 FOR INSTRUCTIONS

COUNTY	DATE PRODUCED	PAGE
NASSAU	07-02-82	2 of 2

	REPORT PERIOD	
249	07-01-82 THRU 07-31-82	1

HVY MET PARAMETER/UNITS	OUT FALL	MONITORING LOCATION		MINIMUM	AVERAGE	MAXIMUM	# EX.	TYPE	FREQUENCY
			LIMIT	*********	5.9000	11.8000		24 HR COMP	2/MONTH
E	004	EFFLUENT VALUE - 100951020401	REPORTED VALUE	*********	0,25	0.30	0		
			LIMIT	*********	0.2000	0.4000		24 HR COMP	2/MONTH
TOTAL	004	EFFLUENT VALUE 201002020401	REPORTED VALUE	*********	0.0004	0.001	0		
			LIMIT	*********	0.3000	0.6000		24 HR COMP	2/MONTH
TAL	004	EFFLUENT VALUE 301051020401	REPORTED VALUE	*********	0.002	0.006	0		
			LIMIT	*********	3.0000	6.0000		24 HR COMP	2/MONTH
SE-TOTAL	004	EFFLUENT VALUE 401055020401	REPORTED VALUE	*********	0.02	0.16	0		
			LIMIT	*********	3.0000	6.0000		24 HR COMP	2/MONTH
UM-TOTAL	004	EFFLUENT VALUE 501105020401	REPORTED VALUE	*********	0.02	0.13	0		
			LIMIT	*********	70.0000	140.0000		24 HR COMP	2/MONTH
	004	EFFLUENT VALUE 685001020401	REPORTED VALUE	*********	0.42	0.42	0		
			LIMIT	*********	0.4000	0.8000		24 HR COMP	2/MONTH
TAL	004	EFFLUENT VALUE 795006020401	REPORTED VALUE	*********	0.03	0.04	0		
			LIMIT	*********	0.4500	0.9000		24 HR COMP	2/MONTH
TOTAL	004	EFFLUENT VALUE 895009020401	REPORTED VALUE	*********	0.02	0.04	0		
			LIMIT	*********	7.0000	14.0000		24 HR COMP	2/MONTH
TAL	004	EFFLUENT VALUE 995012020401	REPORTED VALUE	*********	0.04	0.05	0		
			LIMIT	*********	5.9000	11.8000		24 HR COMP	2/MONTH
(AS S)	004	EFFLUENT VALUE 2039901020401	REPORTED VALUE	*********	0.02	0.02	0		

...eby affirm under penalty of perjury that information provided on this form is true to the best of my ...e and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to ...:45 of the Penal Law.

...NAME AND TITLE

Charles C. Gow Vice President

[X] 1 PERMITTEE
[ ] 2 AGENT

Charles C. Gow

DATE
8/25/82

LI TUNGSTEN CORP
63 HERB HILL ROAD
GLEN COVE NY 11542

NY0008249
04 MPI 02
8S 17 SUB 02 SN 0

PART 1—ENCON COPY

103836

REGION: 1

Major: ___ Non-Major: ✓

TSDF: ___ Substitution: ___

INSPECTION FORM

NEW YORK STATE INDUSTRIAL HAZARDOUS WASTE MANAGEMENT ACT

(Chapter 639, Laws of 1978)

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Henry G. Williams, Commissioner

Division of Solid and Hazardous Waste
Norman H. Nosenchuck, Director

Send to: Compliance Inspection Section
50 Wolf Road - Room 207/415
Albany, New York 12233-0001

EPA I.D. NUMBER: N Y ___ ___ NO protective files no EPA I/D.

*HANDLER'S NAME (Corporate): [illegible]

(Division): ___

*HANDLER'S MAILING ADDRESS: [illegible]

City, State & Zip Code: Glen Cove NY 115 [illegible]

*HANDLER'S LOCATION ADDRESS: ___
(if different than mailing)

City, State & Zip Code ___, ___ ___

*HANDLER'S TELEPHONE NUMBER: ( ) ___ Extension: ___

*FULL NAME OF HANDLER'S CONTACT: (Mr.) (Ms.) [illegible]

*SIGNATURE OF HANDLER'S CONTACT: ___

*TITLE OF HANDLER'S CONTACT: [illegible]

INSPECTION DATE: 12/13/85 TIME OF INSPECTION: 11 (a.m.) (p.m.)

COUNTY: Nassau E/A NUMBER: [illegible]

INSPECTOR'S NAME: [illegible]

TITLE: [illegible]

NAME: R. Frey [illegible]

TITLE: [illegible]

CHECK ONE: Copy of THIS form (___ has) (✓ has not) been given/sent to the Handler.

REPORT PREPARED BY: [illegible] DATE: 12/13/85

REPORT APPROVED BY: [illegible signature] DATE: 12/16/85

(Inspection Form 85-86)

103837

New York State Department of Environmental Conservation
Division of Solid and Hazardous Waste
50 Wolf Road, Albany, New York 12233

PART I

General Information and Classification of Facility

1. Identification of Hazardous Waste - 371 — Yes — No

A. Is there reason to believe the facility has hazardous waste on-site? If yes, what leads you to believe it is hazardous waste? Check appropriate box/boxes and attach any applicable correspondence with DEC or EPA: Yes ____ No ____ \

(1) ____ Company recognizes that its waste is hazardous during the inspection.

(2) ____ Company admitted the waste is hazardous in its RCRA notification and/or Part A permit application.

(3) ____ EPA testing (SWA-46) has shown characteristics of:
( ) ignitability - 371.3(b);
( ) corrosivity - 371.3(c);
( ) reactivity - 371.3(d);
( ) EP toxicity - 371.3(e)

____ Has revealed hazardous constituents (please attach analysis report) 371.4(a)(2), Appendix 22, Appendix 23

(4) ____ The material is listed in the regulations as a hazardous waste from non-specific sources 371.4(b).

(5) ____ The waste material is listed in the regulations as a hazardous waste from specific sources. 371.3(c).

(6) ____ The material or product is listed in the regulations as discarded commercial chemical products, off-specification species, container residues and spill residues thereof. 371.4(d).

(7) ____ Company is unsure, but they have reason to believe that waste materials are hazardous. (Explain) ____

(8) ____ If don't know, please explain: ____
Their waste was not hazardous [illegible] tested by [illegible] Co. [illegible] [illegible] inspection + more test were done.

103838

B. Is there reason, other than those above, for you to believe that there is hazardous waste on site? (Explain) ____________________

____

____

C. What other environmental permits are held by the company, relative to hazardous waste management?

X SPDES Permit Number ✓ Air Permit Number

____ Part 364 Industrial Waste Transporter Permit (indicate this company's permit number if any)

Please describe other relavent (if any) permits and give the name, address, Part 364 Permit Number and EPA I.D. Number of transporter(s) used by company.

____

____

____

D. If the facility is a treatment, storage or disposal facility, have they:

____ Submitted a Part A application. ____ Have changes been made that are not reflected in the Part A application? Should the Part A be modified by the Company? ____ If so, explain.

____

____

____

____

____

____ Submitted a Part B application.

____ Been granted a Part 373 permit.

If so, when does it expire: ____________

Please attach or explain any special conditions or variances - 360.1(g) ____________________

____

____

____

NOT FOR RELEASE TO COMPANY, PROPRIETARY INFORMATION

PART III

Comments, Conclusions and Recommendations Section

Facility Name: Li [illegible]

EPA I.D. No. ____________

Date of Inspection: 12/12/85

General Comments and Conclusions (cite appropriate State regulations in violation and attach additional sheets and other information as required)

Company refines raw material (from [illegible] Canada) for tungsten. Process involves [illegible] for extraction than it is neutralized and water is discharged to creek. (SPDES [illegible]) No hazardous waste [illegible] produced by the [illegible]. Samples have been taken [illegible] solid [illegible] and we want to see if closure plan or cleanup is necessary.

103840

LABORATORY REPORT
CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES
Division of Laboratories and Research
Nassau County Department of Health

1 ☑ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No.

Field No. UN 2183

Source Information (Please Print)

Premises: Li Tungsten
Address: 63 Herb Hill Rd.
Town: Glen Cove
Collection Point: Outfall 004

	Month	Day	Year
Date Collected	11	27	85
Date Received			8
Date Reported			8

Collection Time: 12:30 pm
Collected By: U Niz

Sampler's Comments:

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☑ Water
B ☐ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals	Result	Check	Non-Metals	Result
1	Aluminum mg/l	3.9	15	Chloride mg/l	
2	Arsenic mg/l	<0.005	16	Cyanide mg/l	
3	Barium mg/l		17	Fluoride mg/l	
4	Cadmium mg/l		18	MBAS mg/l	
5	Chromium, Total mg/l		19	pH	
6	Copper mg/l	0.07	20	Phenols mg/l	
7	Iron, Total mg/l	4.10	21	Solids, Suspended mg/l	
8	Lead mg/l	0.32	22	Solids, Total Diss. mg/l	
9	Manganese mg/l	0.17	23	Sulfate mg/l	
10	Mercury mg/l		24	Ammonia nitrogen mg/l	
11	Nickel mg/l	<0.05	25	Kjeldahl nitrogen mg/l	
12	Selenium mg/l		26	Nitrite nitrogen mg/l	
13	Silver mg/l		27	Nitrate nitrogen mg/l	
14	Zinc mg/l	0.07	28	Total Phos. mg/l	

SPECIAL ANALYSIS

Check	Constituent	Result
29	Chromium hex. mg/l	
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		

Examiner's Comments:

ONLY METAL BOTTLE SUBMITTED

103841

ORATORY WORKSHEET

ICAL EXAMINATION FOR TRACE ORGANIC CONSTITUENTS IN WATER, HAZARDOUS WASTES AND SOLID WASTES

Division of Laboratories and Research

Nassau County Department of Health

1 ☐ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab No.

Field No. W-183

No. (Public Water Supply Only)

Source Information (Please Print)

			Month	Da
Premises	Li Tungsten	Date Collected		2
Address	63 Herb Hill Rd	Date Received	11	2
Town	Glen Cove	Date Reported		
Collection Point	outfall 004 Well No.	Collection Time	12:3	
		Collected By:	U.N.	

Sampler's Comments:

- sample on ice

Bureau

1 ☑ Land Resources Management
2 ☐ Public Water Supply
3 ☐ Water Pollution Control
4 ☐ Environmental Sanitation
9 ☐ Other (specify)

SAMPLE TYPE

AQUEOUS				NON-AQUEOUS	
1	Community Well	6	Surface Water	1	Soil
2	Non-Community Well	7	Waste Water	2	Sludge
3	Private Well	(8)	Industrial Effluent	3	Waste Solvent
4	Monitoring Well	9	Raw Supply Water	4	Oil
5	Drinking Water	10	Distribution Water	5	Other (specify)

ANALYSIS TYPE

(A)	Purgeable halogenated hydrocarbons	I	Phthalates
B	Purgeable halogenated hydrocarbons - gases	J	Herbicides
(C)	Purgeable nonhalogenated hydrocarbons	K	Nitrosamines
D	Halogenated pesticides	L	Benzidines
E	Polychlorinated biphenyls	M	Nitroaromatic hydrocarbons
F	Polycyclic aromatic hydrocarbons	N	Haloethers
G	Aldehydes + ketones	O	Chlorinated hydrocarbons
H	Phenols	P	Other (specify)

Examiner's Comments:

DEC 0 5 1985

103842

LABORATORY REPORT
CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES
Division of Laboratories and Research
Nassau County Department of Health

1 ☐ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 24

Field No. VN-180

Source Information (Please Print)

Premises: V. Tungsten
Address: 63 Herb Hill Rd
Town: Glen Cove
Collection Point: catch basin / lagoon. soil sample

	Month	Day
Date Collected	10	7
Date Received		
Date Reported		

Collection Time: 10:00
Collected By: V. Nisco

Sampler's Comments:
- Extraction procedure, please
- DEC sample taken during hurricane

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ ~~Water~~
B ☑ Soil
C ☐ Sludge
D ☐ Waste Sol
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals		Result	Check	Non-Metals		Result
1	Aluminum	mg/l	3.0	15	Chloride	mg/l	
2	Arsenic	mg/l	0.031	16	Cyanide	mg/l	
3	Barium	mg/l	<0.5	17	Fluoride	mg/l	
4	Cadmium	mg/l	0.065	18	MBAS	mg/l	
5	Chromium, Total	mg/l	<0.01	19	pH INITIAL		3.5
6	Copper	mg/l	4.10	20	Phenols	mg/l	
7	Iron, Total	mg/l	10.50	21	Solids, Suspended	mg/l	
8	Lead	mg/l	0.75	22	Solids, Total Diss.	mg/l	
9	Manganese	mg/l	0.37	23	Sulfate	mg/l	
10	Mercury	mg/l	INTERFERENCE	24	Ammonia nitrogen	mg/l	
11	Nickel	mg/l	0.10	25	Kjeldahl nitrogen	mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
13	Silver	mg/l	/	27	Nitrate nitrogen	mg/l	
14	Zinc	mg/l	0.73	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent		
29	Chromium hex.	mg/l	
30	Final pH		
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			

Examiner's Comments

Agnes

2 samples broke

103843

ATORY REPORT
ICAL EXAMINATION OF INDUSTRIAL
AZARDOUS WASTES
of Laboratories and Research
y Department of Health

1 ☑ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 13197

Field No. UN#183

Information (Please Print)

ses Li Tungsten
63 Herb Hill Rd.
Glen Cove
on Point Outfall 004 (SPDES)

	Month	Day	Year
Date Collected	11	27	85
Date Received			8
Date Reported			8
Collection Time	12:30		
Collected By:	UN/JZ		

r's Comments:

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☑ Water
B ☐ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

SPECIAL ANALYSIS

Metals		Result	Check	Non-Metals		Result	Check	Constituent	Result
um 2.0	mg/l	3.9	15	Chloride	mg/l		29	Chromium hex. mg/l	
Arsenic	mg/l	<0.005	16	Cyanide	mg/l		30		
arium	mg/l		17	Fluoride	mg/l		31		
Cadmium	mg/l		18	MBAS	mg/l		32		
hromium, Total	mg/l		19	pH			33		
Copper	mg/l	0.07	20	Phenols	mg/l		34		
ron, Total 0.30	mg/l	4.10	21	Solids, Suspended	mg/l		35		
Lead 0.05	mg/l	0.32	22	Solids, Total Diss.	mg/l		36		
Manganese	mg/l	0.17	23	Sulfate	mg/l		37		
Mercury	mg/l		24	Ammonia nitrogen	mg/l		38		
Nickel	mg/l	<0.05	25	Kjeldahl nitrogen	mg/l		39		
elenium	mg/l		26	Nitrite nitrogen	mg/l		40		
Silver	mg/l		27	Nitrate nitrogen	mg/l		41		
Zinc	mg/l	0.07	28	Total Phos.	mg/l		42		

miner's Comments:

ONLY METAL BOTTLE SUBMITTED

103844

B

RATORY REPORT
MICAL EXAMINATION OF INDUSTRIAL
D HAZARDOUS WASTES
vi... of Laboratories and Research
ssau County Department of Health

B

1 ☐ Routine
2 ☐ Resample
3 ☒ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 13652

Field No. VN196

ource Information (Please Print)

			Month	Day	Year
mises	Li Tungsten	Date Collected	12	13	85
ddress	63 Herb Hill Rd.	Date Received	DEC	13	85
vn	Glen Cove	Date Reported			8
ollection Point	composite of sludge from 6 drums on Li property	Collection Time	11 : am		
		Collected By:	V. Night		

ampler's Comments:

-claylike; dk brown color
-EP Toxicity

FROM DRUMS STORING ORE

Bureau:
1 ☒ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☒ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

	Metals		Result	Check	Non-Metals		Result
1	Aluminum 20	mg/l	25.0	15	Chloride	mg/l	
2	Arsenic	mg/l	<0.005	16	Cyanide	mg/l	
3	Barium	mg/l	<0.5	17	Fluoride	mg/l	
4	Cadmium 0.02	mg/l	0.33	18	MBAS	mg/l	
5	Chromium, Total	mg/l	<0.01	19	pH INITIAL		10.3
6	Copper 1.0	mg/l	34.5	20	Phenols	mg/l	
7	Iron, Total	mg/l	0.41	21	Solids, Suspended	mg/l	
8	Lead	mg/l	0.04	22	Solids, Total Diss.	mg/l	
9	Manganese 0.6	mg/l	20.0	23	Sulfate	mg/l	
10	Mercury	mg/l		24	Ammonia nitrogen	mg/l	
11	Nickel 1.0	mg/l	32.0	25	Kjeldahl nitrogen	mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
13	Silver	mg/l		27	Nitrate nitrogen	mg/l	
14	Zinc 5.0	mg/l	21.5	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent		Result
29	Chromium hex.	mg/l	
30	FINAL pH		5.5
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			

miner's Comments

103845

E

LABORATORY REPORT
CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES
Division of Laboratories and Research
Nassau County Department of Health

1 ☐ Routine
2 ☐ Resample
3 ☑ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 13651

Field No. UN-195

Source Information (Please Print)

		Month	Day	Year
Premises	Li Tungsten			
Address	63 Herb Hill Rd			
Town	Glen Cove			
Date Collected		12	13	85
Date Received		DEC	13	85
Date Reported				8

Collection Point: composite of recharge basin soil across street from Li; on Garvies Pt. Rd.

Collection Time: 10:50 am

Collected By: [illegible]

Sampler's Comments:
- sample orange } Large
- EP Toxicity } Settling POND

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☑ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

	Metals		Result	Check	Non-Metals	Result
1	Aluminum	2.0 mg/l	25.0	15	Chloride mg/l	
2	Arsenic	mg/l	0.015	16	Cyanide mg/l	
3	Barium	mg/l	<0.5	17	Fluoride mg/l	
4	Cadmium	0.02 mg/l	0.094	18	MBAS mg/l	
5	Chromium, Total	mg/l	0.02	19	pH initial	9.5
6	Copper	1.0 mg/l	4.45	20	Phenols mg/l	
7	Iron, Total	mg/l	0.10	21	Solids, Suspended mg/l	
8	Lead	0.05 mg/l	0.08	22	Solids, Total Diss. mg/l	
9	Manganese	0.6 mg/l	13.3	23	Sulfate mg/l	
10	Mercury	mg/l		24	Ammonia nitrogen mg/l	
11	Nickel	2.0 mg/l	6.75	25	Kjeldahl nitrogen mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen mg/l	
13	Silver	mg/l		27	Nitrate nitrogen mg/l	
14	Zinc	mg/l	10.5	28	Total Phos. mg/l	

SPECIAL ANALYSIS

Check	Constituent	Result
29	Chromium hex. mg/l	
30	Final pH	5.6
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		

Examiner's Comments

103846

BORATORY REPORT
HEMICAL EXAMINATION OF INDUSTRIAL
AND HAZARDOUS WASTES
n of Laboratories and Research
Nassau County Department of Health

1 ☑ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 1913

Field No. VII-74

Source information (Please Print)

		Month	Day	Ye
Premises	Li Tungsten			
Date Collected		[illegible]	[illegible]	8
Date Received				8
Date Reported				8

Address [illegible]
Town Glen Cove
Collection Point across the street from Li Tungsten
[illegible] soil/runoff - running in SE direction -across [illegible] Ct.
Collection Time [illegible]
Collected By: [illegible]

Sampler's Comments:
[illegible] Toxicity
[illegible]

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water D ☐ Waste Solvent
B ☑ Soil E ☐ Oil
C ☐ Sludge F ☐ Other

CHEMICAL EXAMINATION

	Metals		Result	Check	Non-Metals		Result
1	Aluminum	mg/l	<0.5	15	Chloride	mg/l	
2	Arsenic	mg/l	<0.005	16	Cyanide	mg/l	
3	Barium	mg/l	<0.5	17	Fluoride	mg/l	
4	Cadmium	mg/l	<0.001	18	MBAS	mg/l	
5	Chromium, Total	mg/l	<0.01	19	pH initial		3.8
6	Copper	mg/l	0.14	20	Phenols	mg/l	
7	Iron, Total	mg/l	0.19	21	Solids, Suspended	mg/l	
8	Lead	mg/l	0.09	22	Solids, Total Diss.	mg/l	
9	Manganese	mg/l	0.33	23	Sulfate	mg/l	
10	Mercury	mg/l	<0.0005	24	Ammonia nitrogen	mg/l	
11	Nickel	mg/l	<0.05	25	Kjeldahl nitrogen	mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
13	Silver	mg/l	<0.05	27	Nitrate nitrogen	mg/l	
14	Zinc	mg/l	0.13	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent		Result
29	Chromium hex.	mg/l	
30	final pH		3.1
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			

Examiner's Comments

MAY 16 1986

103847

LABORATORY REPORT
CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES
Division of Laboratories and Research
[illegible]u County Department of Health

1 ☑ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 1914

Field No. [illegible]-74

Source Information (Please Print)

Premises: [illegible] Tungsten
Address: [illegible] Rd
Town: [illegible]
Collection Point: access [illegible] Tungsten northern most pile of soil - access - [illegible]

	Month	Day	Y
Date Collected	4	4	8
Date Received			8
Date Reported			8

Collection Time: 1:15 [illegible]
Collected By: V. [illegible]

Sampler's Comments:
- EP Toxicity
- [illegible] property

Bureau:
1 ☐ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☑ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals		Result	Check	Non-Metals		Result
1	Aluminum	mg/l	<0.5	15	Chloride	mg/l	
2	Arsenic	mg/l	0.033	16	Cyanide	mg/l	
3	Barium	mg/l	<0.5	17	Fluoride	mg/l	
4	Cadmium	mg/l	<0.001	18	MBAS	mg/l	
5	Chromium, Total	mg/l	<0.01	19	pH initial		3.8
6	Copper	mg/l	0.17	20	Phenols	mg/l	
7	Iron, Total	mg/l	0.64	21	Solids, Suspended	mg/l	
8	Lead	mg/l	0.04	22	Solids, Total Diss.	mg/l	
9	Manganese	mg/l	0.16	23	Sulfate	mg/l	
10	Mercury	mg/l	<0.0005	24	Ammonia nitrogen	mg/l	
11	Nickel	mg/l	<0.05	25	Kjeldahl nitrogen	mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
13	Silver	mg/l	<0.05	27	Nitrate nitrogen	mg/l	
14	Zinc	mg/l	0.12	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent		Result
29	Chromium hex.	mg/l	
30	Final pH		3.1
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			

Examiner's Comments

103848

MAY 16 1986

LABORATORY REPORT
CHEMICAL EXAMINATION OF INDUSTRIAL HAZARDOUS WASTES
Division of Laboratories and Research
Nassau County Department of Health

1 ☑ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 1915

Field No. 11N-75

Source Information (Please Print)

	Month	Day	Year
Date Collected	4	9	86
Date Received			8
Date Reported			8

Premises: Li Tungsten
Address: [illegible]
Town: Glen Cove
Collection Point: [illegible] Tungsten
middle pile of soil - west of fenced tank

Collection Time: 1:20 p.m.
Collected By: [illegible]

Sampler's Comments:
EP Toxicity
area
- access Janet Ct.

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☑ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals		Result	Check	Non-Metals		Result
1	Aluminum	mg/l	<0.5	15	Chloride	mg/l	
2	Arsenic	mg/l	0.041	16	Cyanide	mg/l	
3	Barium	mg/l	<0.5	17	Fluoride	mg/l	
4	Cadmium	mg/l	<0.001	18	MBAS	mg/l	
5	Chromium, Total	mg/l	<0.01	19	pH initial		3.6
6	Copper	mg/l	1.17	20	Phenols	mg/l	
7	Iron, Total	mg/l	3.75	21	Solids, Suspended	mg/l	
8	Lead	mg/l	<0.07	22	Solids, Total Diss.	mg/l	
9	Manganese	mg/l	0.15	23	Sulfate	mg/l	
10	Mercury	mg/l	<0.0005	24	Ammonia nitrogen	mg/l	
11	Nickel	mg/l	<0.05	25	Kjeldahl nitrogen	mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
13	Silver	mg/l	<0.05	27	Nitrate nitrogen	mg/l	
14	Zinc	mg/l	0.13	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent		Result
29	Chromium hex.	mg/l	
30	final pH		3.6
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			

Examiner's Comments

103849

MAY 16 1986

REFERENCE NO. 2

November 30, 1971

Address Reply To:

Radiological Health Unit

Wah Chang Smelting and Refining
Company of America, Inc.
63 Herb Hill Road
Glen Cove, New York 11542

Refer To:

L0464

Att: Mr. F. H. Lee
Radiation Safety Officer

Dear Mr. Lee:

This is in reply to your letter of October 29, 1971.

Our findings indicate that your firm has satisfactorily complied with the State of New York Industrial Code Rule No. 38, "Radiation Protection" governing the possession and use of radiation sources. Accordingly, your New York State License No. 743-0464 and your Registration No. L0464 are hereby cancelled.

Your attention is directed to the Code Rule and in particular, the provisions pertaining to licensing and the maintenance and disposition of records of inactivated installations. Should you desire to resume use of radiation sources at some future date, it will be necessary for you to re-register with, or obtain a license from, this Department.

Please contact us directly if you have any questions, or if we may be of further assistance to you.

Very truly yours,

Morris Kleinfeld, M.D.
Director

by: John A. Miele
Associate Radiophysicist
Licensing Section

JAM:pc
cc: Committee on Licensing

103851

STATE OF NEW YORK
RADIOACTIVE MATERIALS LICENSE

Pursuant to the Labor Law and Industrial Code Rule No. 38, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated below; and to use such radioactive materials for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect of all appropriate regulatory agencies and to any conditions specified below.

Licensee	
1. Name Wah Chang Smelting and Refining Company of America, Inc. 2. Address 63 Herb Hill Road Glen Cove, New York	3. License number 743-0464 4. Expiration date Valid until terminated 5. Reference number 1

6. Radioactive materials (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity licensee may possess at any one time
1. Thorium 2. Thorium	1. Thorium oxide 2. Thorium nitrate	1. 2300 pounds 2. 750 pounds Total thorium not to exceed ~~15mi~~ curies .15 Ci (error in calculation) AVJ

CONDITIONS

9. Authorized use. (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.) 1. As insulator in vacuum furnace.
2. Production of thoriated tungsten powder as step in manufacturing of welding rods.

10. The licensee shall conduct operations involving the use of sources of radiation in compliance with the requirements of New York State Industrial Code Rule No. 38, "Radiation Protection".

11. Any disposal of radioactive waste by the licensee by burial, through the sanitary sewer, or by other release to the environment shall be in accordance with the provisions of Part 16, New York State Sanitary Code Records of all such disposal shall be maintained by the licensee. Monitoring procedures shall be instituted where necessary to demonstrate that concentrations and quantities of radioactive material so disposed of do not exceed permissible levels.

12. The agreement material described in Items 6, 7 and 8 above:
   A. Shall be used only by or under the supervision of either A. Morra or A. Bathie
   B. Shall not be used in or on human beings, in products intended for uncontrolled distribution to the general public, nor in field applications where radioactivity is released.

FOR THE NEW YORK STATE DEPARTMENT OF LABOR

Date ______________ by ______________

Form CCL-6aSL (8-63)

STATE OF NEW YORK
RADIOACTIVE MATERIALS LICENSE

License Number 743-0464

Reference Number: 1

C. Shall be possessed and used by the licensee in accordance with statements, representations and procedures contained in his application dated February 26, 1964, and in related documents as follows:

1. Letter to the United States Atomic Energy Commission dated February 20, 1961, signed by Allen Lau.

2. So much of Part 40, Title 10, Code of Federal Regulations as is applicable to operations of the licensee and not in conflict with Code Rule 33 or the other conditions of this license.

103853

FOR THE NEW YORK STATE DEPARTMENT OF LABOR

Date March 19, 1964

by Nathan Solomon
Nathan Solomon, Ph.D., M.D.
Chief, Radiological Health Unit
For: Morris Kleinfeld. Director. DIH

APA:jb

Form COL-6bSL (8-63)

RADIOLOGICAL HEALTH INVESTIGATION REPORT

A. DATE OF VISIT	11/7/62
B. TYPE OF VISIT	Initial
C. FIRM NAME	Wah Chang Smelting & Refining Co. of America, Inc.
D. REGISTRATION NO	0404
E. LICENSE NO	SNB-135
F. ADDRESS	3 Herbhill Road, Glen Cove, L.I., N.Y.
G. INDUSTRY	Metal Refining
H. NO. OF WORKERS EXPOSED	19
I. PERSON SEEN & TITLE	Mr. Henry Lee, Chief Chemist
J. NAME OF R.S.O. OR REPRESENTATIVE	Henry Lee
K. CONFINES OF INSTALLATION	Grade Level - Groups of factory buildings
L. INSPECTED BY	T. Yele
M. REPORT REVIEW BY	

N. FINDINGS

No.	Group	Item	SOURCES IN VIO.	I.C.	N.A.	No.	Group	Item	SOURCES IN VIO.	I.C.	N.A.
3		Exemptions from C. R. 38			X	26.1b		Radiation Instruments	#1		
4a		Registration		X		26.2		Equipment Surveys			X
b		Changes in Reg'n. Data		X		26.3		Material Surveys			X
5.1		Unlicensed Use or Poss'n.		X		26.4		Unsealed Sources Surveys	#1		
5.2		Exemptions from Licensing			X	26.5		Sealed Sources-Leak Test			X
6.1a	EXEMPTION REQUIREMENTS DEVICES	Radioactivity Increase			X	26.6		Check of Protect. Devices			X
b		Rad'y. in Food or Drug			X	27		Exit from Controlled Area		X	
6.2a		Notification of Receipt			X	28		Eating, etc., in Rad. Area		X	
b		Unauthorized Disposal			X	29a		Decontam. Vacated Inst.			X
c		Labeling			X	b		Survey of Vacated Inst.			X
d		Compliance with Instructions			X	30		Pers. Monitoring Equipment		X	
e		Source Leak Testing			X	31.2a	RADIATION SIGNS	Posting Radiation Area		X	
f		Competent Test Personnel			X	b		Posting High Rad. Area			X
g		Failure of Shielding			X	c		Posting Airb. Rad. Area			X
7		Lic. Application Inadequate		X		d		Posting Rad. Material Area		X	
8a		Lic'g. - Proposal Unsafe		X		32.2		Labeling of Containers		X	
b		Lic'g. - Personnel Unqualified		X		33		Labeling of Rad. Equipment			X
		Compliance with Lic. Terms		X		34.1		Instruction of Personnel		X	
		Special Nuclear Mat'l. Excess			X	34.2		Avail'ty. of Rule 38, etc.		X	
11		Duration of License		X		34.3		Posting Notice to Employees		X	
12		Renewal of License		X		34.4		Med. Services and Reports			X
18a	OTHER LICENSES	More than 20 Days Use			X	35.1a		Secure Storage of Sources		X	
b		Failure to Notify Dept.			X	b		Hazards in Mat'l. Storage		X	
c		Compliance with C. R. 38			X	35.2		Fire Protection for Mat'ls.		X	
d		Compliance with License			X	36.1a	RECORDS MAINTENANCE	For Surveys and Tests		X	
21.1a1	EXCESSIVE DOSE IN CONTROLLED AREA	To Whole Body ☐ Qr. ☐ Yr.		X		b		For Transfer of Material		X	
2		To Hands, etc. ☐ Qr. ☐ Yr.		X		c		For Personnel Exposure		X	
3		Skin ☐ Qr. ☐ Yr.		X		d		For Medical Evaluations			X
b		To Minors		X		36.2		Records Preservation		X	
c		Lifetime		X		37.1a	REPORTS TO I.C.	of Theft or Loss			X
21.2		Controlled Area Int. Exposure		X		b		of Exces. Ext. Exposure			X
22.1a		Uncon. Area Ext. Annual Dose		X		c		of Exces. Int. Exposure			X
b		Uncon. Area Ext. Dose Rate		X		37.2		Exposure Reports to Emp.		X	
22.2		Uncon. Area Internal Dose	#1			38		Cooperation in Inspection		X	
23		Disposal of Rad. Waste		X		39a		Transportation Safeguards		X	
24		Unauthorized Human Use			X	b		Transport Rule Exemption			X
25		Qualified R.S.O.		X							
26.1a		Surveys	#1								

O. RECOMMENDATIONS TO FIRM

Nos. 41 and 46 (Thorium Nitrate and Oxide)

~~P. COMMENTS TO SUPERVISOR~~

1. The company shall make a further radiation survey of the Thorium Nitrate and Thorium Oxide Process Area and Storage Building to ascertain the degree and type of contamination. Surveys should be performed periodically and the results recorded (26.1 - 26.4) (See page 2).

P. Comments to Supervisor: None

IH - 323.1 (8-62)

103854

INVESTIGATION REPORT

DIVISION OF INDUSTRIAL HYGIENE
RADIOLOGICAL UNIT

1. NAME OF FIRM	2. REGISTRATION NO.	3. DATE OF REGISTRATION
Rare Chemical Smelting & Refining Co. of America Inc.	0464	1/20/58
4. ADDRESS 63 Herbhill Road, Glen Cove, L.I., N.Y.		
5. REPORT PREPARED BY J. Hill	6. REVIEWED BY	7. DATE REPORT PREPARED 11/7/62

4. The radioactive material in storage shall be provided with reasonable protection against loss, leakage or dispersion by fire effects or by water, hose streams or other means used to fight fire. (38-35.2)

103855

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

IN REPLY REFER TO
40-943
CAL:PGS

Wah Chang Smelting & Refining Company of
America, Inc.,
Woolworth Building
New York 7, New York

Attention: Mr. Allen Lau, Ass't Treasurer

SOURCE MATERIAL LICENSE

License No. D-607

Dated: DEC 6 1957

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 40.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 40 - Control of Source Material, you are hereby licensed to receive possession of and title to **sixteen hundred (1600) pounds of uranium and thorium compounds during the term of this license, for use as an analytical reagent and in the manufacture of thoriated tungsten wire and columbite metal at your plant locations at Glen Cove, New York and Albany, Oregon.**

You are further licensed to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission, within the limits of his license.

As a condition of this license, you are required to maintain records of your inventories, receipts and transfers of refined source material.

This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission, including 10 CFR 20, "Standards For Protection Against Radiation."

Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

This license shall expire **December 1, 195[illegible]**

FOR THE ATOMIC ENERGY COMMISSION

[illegible]
Chief, Materials Section
Licensing Branch
Division of Civilian Application

CC: Document room
Formal file
Suppl. file
State Health Rep.
Inspection

Enclosure:
10 CFR 20

103856

FORM AEC-2

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

APPLICATION FOR AEC LICENSE TO TRANSFER, DELIVER, EXPORT, OR RECEIVE URANIUM OR THORIUM SOURCE MATERIAL

Pursuant to Code of Federal Regulations, Title 10—Atomic Energy, Part 40—Control of Source Material

Form approved
Budget Bureau No. 38-R068.1

3. PREVIOUS AEC LICENSE NUMBER, IF ANY.

R-150

TO U. S. Atomic Energy Commission
P. O. Box 30, Ansonia Station
New York 23, N. Y.

NAME AND ADDRESS OF APPLICANT (Street, city, zone, state)

Wah Chang Smelting & Refining Co.
of America, Inc.
63 Harbhill Road
Glen Cove, New York

INSTRUCTIONS

File two (2) copies of this application with the U. S. Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, N. Y. This application may be used for an original license or for the renewal of a license. In the case of a renewal, this application should be received by the Commission on or before 30 days before the expiration of the previous license. Complete blocks 1, 2, 3, 9, and if you combine two or more of the activities of Producer, Processor, Distributor, Exporter, or Consumer, complete each of the applicable blocks numbered 4 through 8.

1. INVENTORY. INVENTORY OF SOURCE MATERIAL WAS TAKEN AS OF February 29, 1952 (Specify date of last inventory)

INSTRUCTION.—Include all source material in your possession or under your control, regardless of location. Include any source material you have possession of but which is owned by others, whether or not they are licensees of the Commission. Please specify that part of your inventory which is owned by other persons, listing the names, addresses, and quantities owned by each. Do not include in this inventory any raw source material not yet removed from its place of deposit in nature.

(a) Raw Source Material

DESCRIPTION OF MATERIAL	ESTIMATED PERCENT URANIUM OR THORIUM	QUANTITY IN INVENTORY (Gross tons)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE

(b) Refined Source Material

DESCRIPTION OF MATERIAL	GRADE (Comm., CP, USP, etc.)	PERCENT OF URANIUM OR THORIUM	QUANTITY (Lb.)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE
Uranyl Acetate Reagent	CP	55.98% by wt.	0.620 lbs.	
Thorium Nitrate Crystals	CP	41.66% by wt.	88.733 lbs.	

103857

COPY

Form AEC—410
(1-61)

UNITED STATES
ATOMIC ENERGY COMMISSION

SOURCE MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954, and Title 10, Code of Federal Regulations, Chapter 1, Part 40, "Licensing of Source Material," and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to ~~receive, possess and~~ import the source material designated below; ~~to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of said Part.~~ This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission, now or hereafter in effect, including Title 10, Code of Federal Regulations, Chapter 1, Part 20, "Standards for Protection Against Radiation," and to any conditions specified below.

Licensee	
1. Name Wah Chang International Corporation 2. Address 100 Church Street New York 7, N. Y.	3. License No. STI-782, as amended 4. Expiration Date January 31, 1968 5. Docket No. 40-7216
6. Source Material Monazite Sands	7. Maximum quantity of source material which licensee may ~~possess~~ import at any one time under this license 50 long tons

CONDITIONS

8. Authorized use (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.)

This license authorizes only the import of the above specified source material in accordance with the procedures described in the application dated January 14, 1965.

RECEIVED
MAR 3 1965
DIVISION OF
INDUSTRIAL HYGIENE

For the U. S. ATOMIC ENERGY COMMISSION

Date of issuance FEB 2 1965

Robert L. Layfield
Division of Materials Licensing

★ U. S. GOVERNMENT PRINTING OFFICE : 1962 O - 632985

COPY

103858

REGISTF :TION OF SOURCES OF RADIATION

(See Over For Instructions)

L-1-1?

ʒ ate of New York   Req. No. ________

Department of Labor   Date ________

1. Owner-Name . Wah Chang Smelting & Refining Co. of America, Inc.   Address 63 Herb Hill Road, Glen Cove, N

2. Confines of Installation Same

3. RADIATION PRODUCING EQUIPMENT (Use Additional Sheets if Necessary)   NASSAU

TYPES OF RADIATION SOURCES	Number Fixed	Number Mobile	Size or Rating of Each Machine or Unit	Purpose or Use
Industrial X-Rays				
Medical or Dental X-Rays				
Radioactive Static Eliminators				
Beta Ray Gauge				
Nuclear Reactors				
Particle Accelerators				
High Voltage Equipment				
Other (Specify)				

STATE OF NEW YORK DEPARTMENT OF LABOR
REGISTERED
UNDER RULE 38 OF INDUSTRIAL CODE
DIVISION OF INDUSTRIAL HYGIENE
Date: 6/26/58 By: GG

4. RADIOACTIVE MATERIALS

TYPES	Number Fixed	Number Mobile	Sealed	Un-Sealed	Source Strength	Estimated Quantity Used Annually	Average Quantity on Hand	Purpose or Use
Thorium Oxide	250	100	450			20 - 50 lbs.	800 lbs.	Furnace Lining
Thorium Nitrate		25	50			300 - 400 lbs.	75 lbs.	Thoriated Wire

103859

5. Name and Address of Person in Charge of Radiation Protection
1. Henry Lee,   2. Stanley Grecz

Qualifications 1. Chief Chemist   2. Safety Director

June 12, 1958
Date

Henry Lee
Stanley Grecz
Signature of Person in Charge of Radiation Protection

IH-312 (12-55)

0467

103860

SURVEY RESULTS

LR 2C2 81 Lab. Page 2478

Firm [illegible] - Glen Cove Install # 2464 ☐ Sealed: ☒ Unsealed

# of Samples ____ ☐ Q tip; ☐ Filter; ☒ Other Nuclides Th Survey Date [illegible] Radiophysicist [illegible]

SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET ±2σ	ACTIVITY (pCi) ±2σ	REMARKS
1	TLC analysis			11/4/71		[illegible] Th storage pit.
	~ 100 mls Water as in Spec. Act					
	0-2.0 Mev in 1/2		- 10 min net		N F X One 3 pk areas.	
					$\frac{pCi \times 3}{100 ml\ Vol}$	⇒ for Spec. Act. in pCi/ml (÷ by 100)
1	14.3	1.0	14.3	−7.00 ±1.89	−40.19 ±32.50	so by TLC - mainly
1	161	1.0	161	1.0 ±5.67	0.47 ±7.98	SUBO - no significant
						pks - no need to et
1	210	1.0	210	0.00 ±6.48	0.00 ±7.53	in TC & see 4318 below
1	28	10	2.80	−1.63 ±0.85	−0.64 ±1.01 / 2mls	= −0.32 ± 0.51 pCi/ml
						or total of ~100 mls
						= −32 ± 51 pCi/100 mls

Left margin notes: = Λ_{28}^{25}Th area; 5-Λ_{70} 220 area; 5-Λ_{199} 0-2.0 Mev area; 4318 count; 2.0 ml of 1 sample

∴ No significant amts of activity obt'd for Th in water from storage pit.

Count for TLC above vs Th Std, Instrument 4318 - S - 257 Detector [illegible] gas, prop. Window [illegible]

Voltage 2000 Gain α 5.4 [illegible] Date Counted 11/9-10/71 Radiochemist RFB/LSC

Background 4.43 CPM; Factor₂ = 0.3943 pCi/cpm (net)

473

$3F_2 = 1.1829$

Robert F. Blaw 11/19/71
SIGNATURE (UNIT REVIEW)

[illegible]
SIGNATURE (SECTION REVIEW)

SURVEY RESULTS 103861

LR 200 Ft [illegible] Lab. Page 2450

Firm [illegible] Install # LC401 ☐ Sealed; ☑ Unsealed

# of Samples 23 ☐ Q tip; ☑ Filter; ☐ Other Nuclides Th Survey Date [illegible] Radiophysicist [illegible]

SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET	ACTIVITY (pCi)	REMARKS
1	37	5	1.20	5.76 ± 0.87	5.03 ± 2.13	
2	7	5	1.80	1.56 ± 0.49	1.17 ± 1.24	
3	5	5	1.00	0.56 ± 0.38	0.49 ± 1.00	
4	3	5	0.60	0.16 ± 0.32	0.14 ± 0.84	
5	5	5	1.00	0.56 ± 0.38	0.49 ± 1.00	
6	7	5	1.40	0.96 ± 0.43	0.84 ± 1.13	
7	8	5	1.60	1.16 ± 0.45	1.02 ± 1.18	
8	21	5	4.20	3.76 ± 0.68	3.30 ± 1.79	
9	2	5	0.40	-0.04 ± 0.29	-0.04 ± 0.76	
10	5	5	1.00	0.56 ± 0.38	0.49 ± 1.00	
11	14	5	2.80	2.36 ± 0.57	2.07 ± 1.50	
12	5	5	1.00	0.56 ± 0.38	0.49 ± 1.00	
13	13	5	2.60	2.16 ± 0.55	1.89 ± 1.45	
14	13	5	2.60	2.16 ± 0.55	1.89 ± 1.45	
15	4	5	0.80	0.36 ± 0.28	0.32 ± 0.74	
16	3	5	0.60	0.16 ± 0.32	0.14 ± 0.84	
17	11	5	2.20	1.76 ± 0.51	1.54 ± 1.34	
18	13	5	2.60	2.16 ± 0.55	1.89 ± 1.45	
19	1	5	0.20	-0.24 ± 0.25	-0.21 ± 0.66	
20	3	5	0.60	0.16 ± 0.32	0.14 ± 0.84	

Count for α vs Th 230 Std, Instrument [illegible] on 4318 Detector [illegible]

Voltage 1200 Gain 5.4 [illegible] Date Counted 11/1-71 Radiochemist [illegible]

Background 0.44 CPM; Factor 0.877 pCi/cpm (net)

[illegible] 2.691

Robert F. Blair 11/11/71

SIGNATURE (UNIT REVIEW)

SIGNATURE (SECTION REVIEW)

IH-375 (12-66)

SURVEY RESULTS

LR 2-88 6/1 Lab. Page √1

Firm [illegible] Install # L-0464 Sealed: Unsealed ✓

# of Samples 23 Q tip; ✓ Filter; Other Nuclides [illegible] Survey Date 10/28/71 Radiophysicist [illegible]

SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET ±3σ	ACTIVITY (pCi) ±3σ	REMARKS
1	3225	60	53.75	47.03 ± 2.96	22.57 ± 3.54	
2	784.2	60	13.07	6.35 ± 1.41	3.05 ± 2.03	
3	529.2	60	8.82	2.10 ± 1.25	1.01 ± 1.80	
4	775.8	60	12.93	6.21 ± 1.40	2.98 ± 2.02	
5	718.2	60	11.97	5.25 ± 1.37	2.52 ± 1.97	
6	525	60	8.80	2.08 ± 1.25	1.00 ± 1.80	
7	748.2	60	12.47	5.75 ± 1.39	2.76 ± 2.00	
8	795	60	13.25	6.53 ± 1.41	3.13 ± 2.03	
9	525	60	8.75	2.03 ± 1.24	0.97 ± 1.79	
10	765	60	12.75	6.03 ± 1.40	2.89 ± 2.02	
11	645	60	10.75	4.03 ± 1.32	1.93 ± 1.90	
12	664.8	60	11.08	4.36 ± 1.33	2.09 ± 1.92	
13	846	60	14.1	7.38 ± 1.44	3.54 ± 2.07	
14	847.8	60	14.13	7.41 ± 1.44	3.56 ± 2.07	
14	400.2	60	6.67	-0.05 ± 1.16	-0.02 ± 1.67	
16	475.8	60	7.93	1.21 ± 1.21	0.58 ± 1.74	
17	334.8	60	5.58	-1.14 ± 1.11	-0.55 ± 1.60	
18	571.2	60	9.52	2.80 ± 1.27	1.34 ± 1.83	
19	444	60	7.40	0.68 ± 1.19	0.33 ± 1.71	
20	364.8	60	6.08	-0.64 ± 1.13	-0.31 ± 1.63	

Count for β vs Th Std, Instrument B-200 4318 Detector [illegible]

Voltage [illegible] Gain × 5.4 [illegible] Date Counted 11/1/71 Radiochemist [illegible]

Background 6.72 CPM; Factor Th 0.480 pCi/cpm (net)

[illegible] $3\sigma = 1.440$

Robert F. Blais 11/11/71
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[illegible signature]
SIGNATURE (SECTION REVIEW)

103863

SURVEY RESULTS

LR ______ 6__ Lab. Page ______

Firm ______ Install # ______ Sealed: Open

# of Samples 23 Q tip; Filter; Other Nuclides ______ Survey Date ______ Radiophysicist ______

SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET ±	ACTIVITY (pCi) ±	REMARKS
31	21	5	4.20	±0.65	±1.79	avg Total α as Ra^{226} - 23 fpr
32	242	5	48.40	47.96 ±2.21	42.06 ±5.81	+ = 68.74
33	1	5	0.20	±0.25	-0.21 ±0.66	− = -0.46
						avg = 68.28 ± 8.24 pCi
		rad 11/1/71 TMC Anal. 23 fp grp 0-2.0 Mev in 1/2				
		1.0 min net NI x One 2 plo area				
1→23	128	1.0	128	-32 ±5.37	-15.02 ±7.56	by TMC - mainly St.
						no truly significant
1→23	186	1.0	186	-24 ±6.29	-9.30 ±7.31	plas obs'd

5/170 0.226 ma

5/199 0-2.0 Mev area

Count for α vs Ra^{226} Std, Instrument A-25C on 4318 Detector ______

Voltage 1200 Gain X 5.4 ______ Date Counted 11/1/71 Radiochemist ______

Background 0.44 CPM; Factor 0.877 pCi/cpm (net)

avg/50 ______ 35 = 2.631

Robert F. Blais 11/11/71

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IH-275 (12-66)

103864

SURVEY RESULTS

LR [illegible] 6[illegible] Lab. Page [illegible]

Firm [illegible] Install # L-0464 Sealed: Unsealed ✓

# of Samples 23 Q tip; Filter ✓; Other Nuclides Th, [illegible] Survey Date 10/28/71 Radiophysicist AHJ

SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET ±2σ	ACTIVITY (pCi) ±2σ	REMARKS
21	846	60	14.10	7.38 ±1.44	3.54 ±2.07	alg Total β vs Th — 23 fpos
22	3742.5	60	62.35	55.66 ±2.63	26.72 ±3.79	+ = + 88.27
23	622.5	60	10.38	3.66 ±1.31	1.76 ±1.89	− = − 0.88
						alg Total = 87.39 ± 10.09 pCi

Count for β vs Th Std, Instrument B-NE 4318 Detector [illegible]

Voltage [illegible] Gain X5, 4 [illegible] Date Counted 11/1/71 Radiochemist TBC/RED

Background 6.920 CPM; Factor 0.480 pCi/cpm (net)

[illegible]/5ar.

3σ = 1.440

Robert F. Blais 11/11/71

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103865

SURVEY RESULTS

LR [illegible] Lab. Page [illegible]

Firm [illegible] Install # [illegible] Sealed: Unsealed

# of Samples 23 Q tip; Filter; Other Nuclides [illegible] Survey Date [illegible] Radiophysicist [illegible]

	SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET	ACTIVITY (pCi)	REMARKS
11	1	758	40	18.95	-1.50 ±1.95	-4.00 ±15.97	
12	2	770	40	19.25	-1.20 ±1.95	-3.20 ±16.05	
13	3	710	40	17.75	-2.70 ±1.95	-7.20 ±15.72	
14	4	806	40	20.15	-0.30 ±2.01	-0.80 ±16.21	
15	5	696	40	17.40	-3.05 ±1.97	-8.17 ±16.05	
16	6	766	40	19.15	-1.30 ±1.96	-3.47 ±16.05	
17	7	767	40	19.18	-1.27 ±1.99	-3.38 ±16.05	
18	8	901	40	22.53	+2.08 ±2.07	+5.55 ±16.69	
19	9	688	40	17.20	-3.25 ±1.94	-8.67 ±16.64	
20	10	710	40	17.75	-2.70 ±1.95	-7.20 ±15.72	
21	11	731	40	18.28	-2.17 ±1.97	-5.79 ±15.89	
22	12	698	40	17.45	-3.00 ±1.95	-8.00 ±15.72	
23	13	834	40	20.95	+0.53 ±2.04	+1.41 ±16.45	
24	14	800	40	20.00	-0.45 ±2.01	-1.19 ±16.21	
25	15	761	40	19.03	-1.42 ±1.99	-3.79 ±16.05	
26	16	675	40	16.88	-3.57 ±1.93	-9.50 ±15.56	
27	17	643	40	16.08	-4.37 ±1.91	-11.66 ±15.40	
28	18	667	40	16.68	-3.77 ±1.93	-10.06 ±15.56	
29	19	766	40	19.15	-1.30 ±1.99	-3.47 ±16.05	
30	20	635	40	15.88	-4.57 ±1.91	-12.18 ±15.40	

Count for ^3H vs ^3H Std, Instrument 40-362 RDFH Detector Liquid Scintillation

Voltage optfact set Gain 51% 40-900 Date Counted 11/3-9/71 Radiochemist [illegible]

Background 20.45 CPM; Factor 2.688 pCi/cpm (net) H efficiency - 36.136%

372 = 8.004

Robert F. Blair 11/11/71
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[illegible]
SIGNATURE (SECTION REVIEW)

IH-275 (12-66)

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SURVEY RESULTS

LR [illegible] 5[illegible] Lab. Page 24[illegible]

Firm [illegible] Install # [illegible] Sealed: Unse

# of Samples 23 Q tip; Filter; Other Nuclides [illegible] Survey Date [illegible] Radiophysicist [illegible]

	SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET ±3S	ACTIVITY (pCi) ±3S	REMARKS	
TC 36240 31	21	839	40	20.45	+0.45 ±2.03	+ 1.25 ±16.37	alg Total H3 pls vs H3 23 fps	
32	22	1655	40	41.35	+20.92 ±2.49	+ 55.54 ±20.08	+ = 64.08	
33	23	766	40	19.15	-1.30 ±1.99	- 3.47 ±16.05	- = -115.17	
							alg = -51.09 ± 97.41 pCi	
				Using Pk integ[illegible]			using NH4 [illegible]	Activity using NH4 ± 3S
18	8	901	40	22.53	+2.08	- 3.60	1.52 ± 2.09	-4.09 ± 16.69
23	13	839	40	20.93	+0.53	- 3.17	-2.64 ± 2.04	-7.10 ± 16.45
31	21	837	40	20.93	+ 0.48	- 2.91	-2.43 ± 2.03	-6.53 ± 16.37
32	22	1655	40	41.38	+20.93	- 50.45	-29.52 ± 2.49	-79.35 ± 20.08

above yall neg on H3 pls

by -97.07 ± 34.93 pCi NH4

Count for H3 vs H3 Std, Instrument TC 362 BDFH Detector liquid scintillation

Voltage optofact set Gain 51% 40-400 Date Counted 11/3-9/[illegible] Radiochemist [illegible]

Background 20.45 CPM; Factor 2.688 pCi/cpm (net) H3 in TC on C14 pk - 36.136%

3S = 8.064

Robert F. Blair 11/11/[illegible]

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Dr [illegible]

SIGNATURE (SECTION REVIEW)

IH-375 (12-66)

103867

SURVEY RESULTS

LR 200 6 1 Lab. Page 24 F5

Firm [illegible] Install # LE 464 Sealed: Unse

# of Samples 23 Q tip; Filter: Other des [illegible] Survey Date 10/28/71 Radiophysicist [illegible]

	SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET ±2σ	ACTIVITY (pCi) ±3σ	REMARKS
11	1	13[illegible]	40	34.20	+1.[illegible] ±2.5[illegible]	+1.32 ±5.19	
12	2	1,223	40	30.58	-1.75 ±2.51	-1.17 ±5.05	
13	3	1,169	40	29.23	-3.10 ±2.45	-2.08 ±4.98	
14	4	1,301	40	32.53	+0.20 ±2.55	+0.13 ±5.13	
15	5	1,256	40	31.40	-0.93 ±2.52	-0.62 ±5.07	
16	6	1,298	40	32.45	+0.12 ±2.55	+0.08 ±5.13	
17	7	1,237	40	30.93	-1.40 ±2.52	-0.94 ±5.07	
18	8	1,729	40	43.23	+10.90 ±2.75	+7.30 ±5.53	
19	9	1,164	40	29.10	-3.23 ±2.48	-2.16 ±4.98	
20	10	1,278	40	31.95	-0.38 ±2.54	-0.25 ±5.11	
21	11	1,344	40	33.60	+1.27 ±2.57	+0.85 ±5.17	
22	12	1,236	40	30.90	-1.43 ±2.51	-0.96 ±5.05	
23	13	1,677	40	41.93	+9.60 ±2.73	+6.43 ±5.49	
24	14	1,432	40	35.80	+3.47 ±2.61	+2.32 ±5.25	
25	15	1245	40	31.13	-1.20 ±2.52	-0.80 ±5.07	
26	16	1,207	40	30.18	-2.15 ±2.50	-1.44 ±5.03	
27	17	1,153	40	28.83	-3.50 ±2.47	-2.35 ±4.96	
28	18	1,212	40	30.30	-2.03 ±2.50	-1.36 ±5.03	
29	19	1,247	40	31.18	-1.15 ±2.52	-0.77 ±5.07	
30	20	1,176	40	29.40	-2.93 ±2.48	-1.96 ±4.98	

Count for C^{14} vs C^{14} Std, Instrument 7.C 362 RDFH Detector Liquid Scintillation

Voltage opt ~~set~~ Gain 5.1% 40-1000 Date Counted 11/3-9/71 Radiochemist RFB/[illegible]

Background 32.33 CPM; Factor 0.670 pCi/cpm (net) C^{14} eff on #3 = 33.056%

3E = 2.010

Robert F. Blais 11/11/71

SIGNATURE (UNIT REVIEW)

D. [illegible] 11/11

SIGNATURE (SECTION REVIEW)

IH-375 (12-66)

103868

SURVEY RESULTS

LR 200 & 71 Lab. Page 2416

Firm [illegible] Install # [illegible] ☐ Sealed; ☐ Unseal

# of Samples 23 ☐ Q tip; ☑ Filter; ☐ Other Nuclides [illegible] Survey Date 10/28/71 Radiophysicist Jones

SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET ±2σ	ACTIVITY (pCi) ±3σ	REMARKS
31 21	1645	40	41.13	+8.86 ±2.71	+5.[illegible] ±5.45	avg Total C14pb vs C14 Std
32 22	7398	40	184.96	+152.62 ±4.66	+162.26 ±9.37	+ = 126.59
33 23	1241	40	31.02	-1.30 ±2.52	-0.87 ±5.07	- = -17.86
						~~avg = +108.73 ± 25.82 pCi~~
		Using Pb efficiencies on following				FO corrected cpm | Activity based on C14pb ±3σ
18 8	1729	40	43.23	+10.96 ±2.[illegible]	-0.756	+10.15 ±2.75 | +6.80 ±5.53
23 13	1677	40	41.93	+9.66 ±2.73	-0.119	+9.41 ±2.73 | +6.30 ±5.49
31 21	1645	40	41.13	+8.86 ±2.71	-0.119	+8.63 ±2.71 | +5.78 ±5.45
32 22	7398	40	184.95	+152.62 ±4.66	-7.56	+145.06 ±4.66 | +97.19 ±9.37

above 4 all + C14pb

Total = 116.07 ± 13.37 pCi

Count for C14pb vs C14 Std, Instrument TC 362 BDFH Detector liquid scintillator

Voltage optimal set Gain 5.1%, 40-1000 Date Counted 11/3-9/71 Radiochemist [illegible]/RFB

Background 32.33 CPM; Factor 0.670 pCi/cpm (net) C14 to C14pb = 33.056%

3σ = 2.010

Robert F. Blais 11/11/71
SIGNATURE (UNIT REVIEW)

D. [illegible] Stein 11/11
SIGNATURE (SECTION REVIEW)

IM 275 (12-66)

103869

INVESTIGATION REPORT

DIVISION OF INDUSTRIAL HYGIENE
RADIOLOGICAL UNIT

1. NAME OF FIRM	2. REGISTRATION NO.	3. DATE OF REGISTRATION
Wah Chang Div Teledyne Inc.	20404	
4. ADDRESS		
Glen Cove		
5. REPORT PREPARED BY	6. REVIEWED BY	7. DATE REPORT PREPARED
A. [illegible]	[illegible]	

On 1/25/72 I visited the above firm to perform a temporary survey of their facility, as their plant was being shutdown on 12/31/72. I responded to a call from H. Lee RSO for the firm. He indicated that he had performed a final survey but had not mailed it in yet. I said I would pick it up when I made my visit.

On arrival I met with Mr. Lee & H. Hughes acting plant manager who will remain on the premises until 12/31/72 when Wah Chang Albany's license expires. Most workers were laid off 12/7/72 including H. Lee the RSO.

There are two areas of concern at Wah Chang. One was a pit where containers of ThO_2 were stored for a long period of time & the ~~#~~ other was the reduction plant where $Th(NO_3)_4$ was used in the mfg. of ~~the~~ welding rods. Mr. Lee informed me a survey performed in both areas. Also H. Lee showed disposal records [illegible] Copy of [illegible] ~~[illegible]~~ [illegible] showing a [illegible] that [illegible] $Th(NO_3)_4$

INVESTIGATION REPORT

DIVISION OF INDUSTRIAL HYGIENE
RADIOLOGICAL UNIT

1. NAME OF FIRM	2. REGISTRATION NO.	3. DATE OF REGISTRATION

4. ADDRESS

5 REPORT PREPARED BY	6 REVIEWED BY	7. DATE REPORT PREPARED

previously on hand was included in a shipment to be made to Walt Chaney in Huntsville Ala. Although the shipment hadn't left as yet, I was assured that it would leave on 10/29/71.

I instructed Mr. Lee to wait until then to send me letter with final survey and to include a copy of the shipping sheet.

I then made and submitted a wipe survey of both areas.

Action: Release letter to be sent pending lab results.

103870

REFERENCE NO. 3

NUS CORPORATION AND SUBSIDIARIES **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
	7/31/89	13:50

DISTRIBUTION: FILE - LI TUNGSTEN TDD 02-8907-78-PA
BRICS NYJLPA

BETWEEN:	OF:	PHONE:
CHARLES FITZSIMMONS	EPA - EDISON	(201) 321-6608

AND: STEVE OKULEWICZ NUS FIT EDISON NJ.

DISCUSSION:

LI TUNGSTEN - CURRENT INFO & SITE STATUS

MR. FITZSIMMONS INFORMED ME THAT THE CORRECT NAME OF THE SITE IS LI TUNGSTEN, NAMED AFTER ITS OWNER AND THAT THE SITE IS CURRENTLY OWNED BY OLD COURT SAVINGS AND LOAN CORPORATION OF BALTIMORE MARYLAND. THIS SAVINGS & LOAN CORPORATION LEASED THE SITE TO LI TUNGSTEN FROM 1984 - 1985, AFTER WHICH LI TUNGSTEN WENT BANKRUPT IN 1985. LI TUNGSTEN WAS ORIGINALLY OWNED BY WAH CHANG SMELTING COMPANY FROM 1940 TO 1985. THE SITE IS IN THE CLEAN UP PROCESS AND ALL SURFICIAL CONTAINERS INCLUDING TANKS, CRATES, DRUMS, PONDS, LABORATORY REAGENTS AND SOME OF THE WASTE PILES WILL BE REMOVED BY JANUARY OF 1990, PROVIDED THE PLAN REMAINS ON SCHEDULE. NO GROUNDWATER

~~ACTION ITEMS:~~

CLEAN UP IS SCHEDULED AT THIS TIME. A RADIATION SURVEY WAS JUST COMPLETED, BUT ITS RESULTS ARE NOT KNOWN PRESENTLY. PLANT WAS SHUT DOWN IN 1985.

REFERENCE NO. 4

LI TUNGSTEN SITE INVESTIGATION REPORT (Volume 1)

Prepared For:

Campon Realty Corp.

445 Fifth Avenue

New York, NY 10016

Prepared by:

RTP Environmental Associates, Inc.

400 Post Avenue

Westbury, NY 11590

May, 1988

DRAFT

VOLUME 1

LI TUNGSTEN SITE INVESTIGATION REPORT

TABLE OF CONTENTS

SECTION

SECTION 1.0

EXECUTIVE SUMMARY

LI TUNGSTEN SITE ENVIRONMENT INVESTIGATION REPORT

1.0 EXECUTIVE SUMMARY

This site environmental investigation report summarizes the activities and findings of RTP Environmental Associates, Inc. and subcontractors at the Li Tungsten, Glen Cove, New York site. An investigation of site groundwater, soils, structures and equipment focused on determining the nature and extent of any potential or existing environmental contamination. The overall goal of the study was to determine the appropriate procedures and estimated costs for closure of the site, prior to its future intended use as a residential development.

The investigation protocol is detailed in the RTP contract with Campon Realty Corporation. RTP has successfully completed all the terms and conditions of its contract. The study began on March 25, 1988 and ended on May 13, 1988. The time frame for this investigation was limited and the study was designed to uncover the maximum amount of information about site remediation requirements within this limited time frame. Furthermore, coordination with regulatory agencies was restricted by the terms of RTP's contract in this phase of work. Thus, the study cannot be considered a comprehensive assessment of all site environmental matters as may be required by regulatory agencies for purposes of planning site remediation and obtaining a complete clean bill of health. The estimated costs for remediation, preferred alternatives and schedules may need adjustment once coordination with regulatory agencies is initiated.

This executive summary contains a discussion of the findings, outlining the specific cost/benefits of various alternatives. The supporting documents, as supplied by RTP subcontractors, have been provided in the remainder of this report for completeness.

As a preface to the discussion of findings, we note that our investigation has uncovered several new and significant environmental contamination problems at the site. These include underground plumes of oil contaminated soils and solvent contaminated groundwater. Specifically, the identified PCE plume was found to be rather extensive, a hazardous VOC plume from the Mattiace property was identified, and subsurface oil contamination was found in two separate locations. Due to the conditions of low soil permeability, we are forced to predict a rather lengthy period for remediation of these conditions. Finally, the uppermost groundwater throughout the facility shows evidence of infiltration by metals from processing activities at the facility. Thus, the site has substantial environmental problems that go beyond those typically associated with conversion of industrial sites to residential use. This does not mean that remediation sufficient to satisfy regulatory requirements is not attainable. In fact, our review of remediation procedures, costs and schedules indicates that the concept of a successful cleanup plan is a plausible one and that serious discussions with regulatory agencies in this regard may prove worthwhile. **Nonetheless**, it is important to **keep in mind that the site has been found to pose some substantial remediation challenges, each of which has alternative** methods of resolution.

The costs provided and the schedules given in Section 1.4 pertaining to remediation recognize the uncertainties described above and are intended to be best estimates of actual costs, if site remediation as envisioned by RTP begins within the next few months. Costs and schedules are based upon current New York State requirements and our estimates of how applicable review procedures will be implemented in this case. **Costs and time lines will likely expand should New York State pass** new **legislation or if remediation** is delayed for a lengthy **period.**

This executive summary consists of five subsections covering the various aspects of study findings and conclusions.

1.1 QUALITY AND QUANTITIES OF MATERIALS ONSITE

The following is a brief discussion of the types and quantities of materials onsite. The details are provided in the annotated sections of this report.

Stored Materials

An estimated volume of **11,000 cubic yards, 17,000 tons of solid residue/ore materials are onsite.** These materials are contained in various drums, crates, piles, etc. in almost all areas of the site and are present as landfill material in a significant portion of the northwest and northern portions of the site. **These have been screened for metals and** E.P. Toxicity **and have been** shown to contain **substantial heavy metal concentrations but to be non-toxic.** When **detailed** analyses **are conducted for remediation,** some [redacted] as being E.P. toxic. An estimated volume of 350,[redacted] liquids are stored onsite. These liquids will be best handled by transporting offsite to a disposal location. An estimated 131[redacted] **hazardous organic liquids are stored onsite** and these will need to be manifested and removed. **Three main laboratory** areas with **substantial chemical** inventories have **been identified which will require special** treatment. **These should be** packed and removed from the site.

103880

Subsurface Conditions

A tetrachloroethene (PCE) plume is one of several plumes that have been detected onsite as shown in Figure E-1. The exact plume extent will need to be better defined. The area surrounds groundwater monitoring wells GM-9, GM-3D, EMW-1 and GM-6. Purportedly a dry cleaning fluid was discharged on an adjoining property.

Discussions with the current tenant of the adjoining property suggest that there was never dry cleaning on the site, however, the Nassau County Department of Health (NCDOH) has a record of dry cleaning solvents on the adjoining property.

A 1,1,1 trichloroethane plume has been detected onsite and its aerial extent is roughly estimated in Figure E-1. The plume is in the vicinity of a groundwater monitoring well GM-10 and the likely source is the Mattiace property. This property is currently under investigation by the USEPA, New York State Department of Environmental Conservation (NYSDEC) and NCDOH and is currently undergoing remediation.

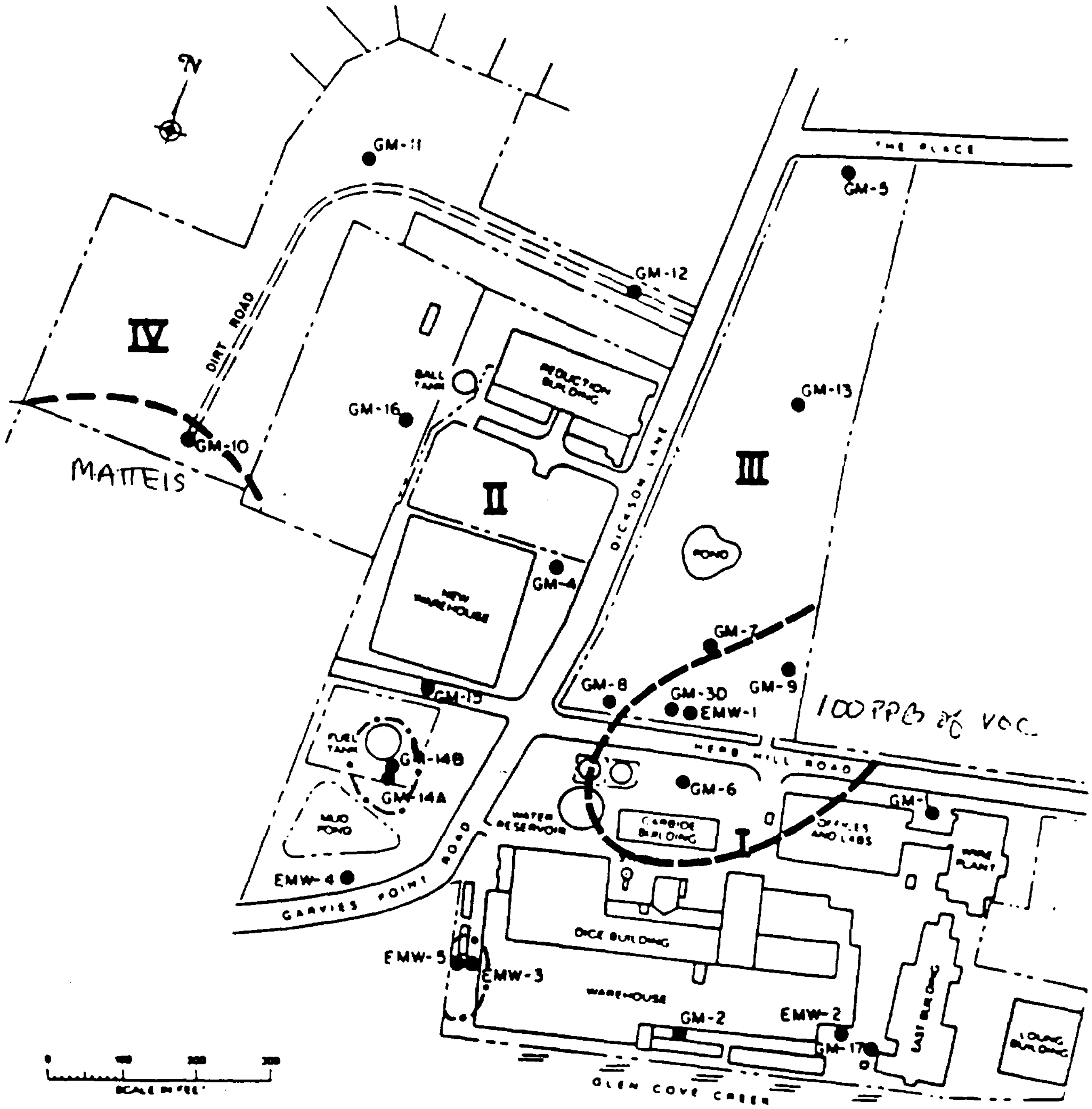
An oil plume has been detected under the 500,000 gallon No. 2 "fuel tank" and is also located on Figure E-1. This tank was leased by an oil supplier and numerous spills have been reported to NCDOH at this site. A smaller partially remediated spill was detected on the southwest corner of the property near Glen Cove Creek.

A waste/process water solution plume which contains heavy metals has been detected onsite emanating from under the location of the mud pond (Figure E-1).

RTP ENVIRONMENTAL ASSOC., INC

4-88 SHOWN

N1342L11-1047



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EXPLANATION

II	PARCEL NUMBER	— • —	INFERRED EXTENT OF OIL PLUME
		●	MONITORING WELL LOCATION
— - —	PROPERTY/PARCEL BOUNDARY	— —	INFERRED EXTENT OF VOC PLUME WITH CONCENTRATION OF 100 ppb OR GREATER

NOTE: REFER TO TABLE 3 FOR CONCENTRATIONS OF VOCs DETECTED IN MONITORING WELLS SAMPLED IN SPRING 1987 AND SPRING 1988

SUBJECT

INFERRED EXTENT OF PLUME OF VOCs IN SHALLOW GROUND-WATER SYSTEM IN THE VICINITY OF LI TUNGSTEN, GLEN COVE, NEW YORK

FIGURE E-1

Finally, a significant but undetermined volume of site soils have been contaminated by the above materials.

Structures and Related Materials

There are 224 tanks of various sizes and shapes that have been inventoried during the site study. The total capacity of tanks is over 2,000,000 gallons. The tanks range from empty to full on current inventory, and approximately 350,000 gallons of liquid is in the tanks.

There are six (6) main buildings with associated ancillary equipment and support structures onsite that need to be removed. There is also a large inventory of scrap machinery and equipment that resides onsite. There are 23 transformers onsite believed to contain PCB (polychlorinated biphenyl), contaminated oils. There is a substantial asbestos inventory onsite which includes the sidings on buildings, tank covers, and pipe coverings.

1.2 IMMEDIATE HAZARDS

Several immediate hazards have been identified during the course of our site investigation work. All identified hazards were provided to Glen Cove Development Company in a project memorandum along with the recommendation that these hazards be remediated immediately. It is our understanding that the Glen Cove Development Company is currently developing a plan for addressing all identified immediate hazards. Once the plan is completed, the site would be in a relatively stable condition.

1.3 CURRENT AND FUTURE LIABILITIES

There are several rules and regulations that are applicable to the various parties involved in the Li Tungsten site. The critical rules deal with conditions that are immediate threats to the environment (e.g. oil spills) and the requirements once a party becomes involved. In summary, if an immediate threat to the environment or to human health exists, there are reporting obligations. If an owner has knowledge of such a condition onsite, then the owner is responsible for its remediation to the satisfaction of the regulatory agencies. The extent of liability, the potential for enjoining other potentially responsible parties (PRP) to assist in the cleanup and the general rules that apply or may apply to the various parties involved are addressed in greater detail in Section 3 of this report.

In this regard, RTP has reported to the Nassau County Health Department (NCDOH) and the New York State Department of Environmental Protection (NYSDEC) the results of the groundwater sampling program that fall into the reportable category.

This includes the oil contamination that surrounds the 500,000 gallon fuel tank, the organic plume that appears to be coming from the Mattiace property and the tetrachloroethene and organic plume that appears to be coming from the former laundry (Crown-Dyckman Uniforms) property.

1.4 MEASURES FOR SITE REMEDIATION

In all likelihood, whether or not Campon Realty decides to purchase the parcels, NYSDEC will classify the site as an inactive hazardous waste site and then require the owner to develop and implement a remediation plan to cleanup the site. This is standard procedure for any site currently classified as an industrial site that is no longer in operation or is being converted to residential use in New York State (especially on Long Island). In addition, now that the NCDOH and NYSDEC have knowledge of the organic and oil spills that are uncontrolled on the property, there will be a cleanup action required regardless of ownership. The overall site cleanup and remediation plan will at a minimum, have several elements. Each of the currently identified elements are outlined in Table E-1.

The cost estimates in Table E-1 are separated into a best estimate which means the likely cost of cleanup and a conservative estimate if difficulties arise during remediation. The basis for each cost estimate and schedule is addressed below. Please recognize these prices are likely to hold for approximately 60-days from the date of this report. Delays in beginning remediation beyond that point will likely cause an increase in cleanup and remediation prices.

Liquids/Sludges in Tanks

RTP estimates that 350,000 gallons of various liquid waste need to be pumped and disposed. An additional 188,000 gallons will be produced during the cleaning of the tanks. This total comes to 538,000 gallons which at $0.52 per gallon for removal and disposal amounts to a remediation cost of $279,800. A one hundred percent contingency fee has been added to provide a conservative estimate of cleanup of $559,600. This is based upon the fact that disposal costs vary due to available capacities of disposal facilities and the types of wastes involved. The current owner is likely to remediate 130,000 gallons of onsite liquids for a total savings of $84,500. With remediation, the best estimate is therefore $195,300, while the conservative estimate does not assume any immediate remediation.

TABLE E-1

ESTIMATED COSTS AND SCHEDULE FOR REMEDIATION

Material/Element	Estimated Cost of Cleanup (Best Estimate)	Estimated Cost of Cleanup (Conservative Estimate)	Schedule
1. Liquids/Sludges in Tanks	$ 195,300	$ 559,600	3-4 months
2. Tank Cleaning	203,000	243,600	3-4 months
3. Structural Demolition/Removal	1,020,000	1,530,000	6 months
4. Asbestos Removal/Disposal	486,300	656,300	2 months
5. Laboratory Packing/Disposal	65,500	236,000	2 months
6. Solid Waste Removal/Disposal	549,100	3,657,000	3-4 months
7. Transformer Removal/Disposal	85,700	119,400	2 months
8. PCE Spill Cleanup	675,000	1,100,000	5-10 years
9. Mattiace Spill Cleanup	550,000	975,000	5-10 years
10. No. 2 Oil Spill Cleanup	150,000	300,000	2 months
11. Mud Pond Cleanup	575,000	1,300,000	6 months
Subtotal Cost	$ 4,554,900	$ 10,677,100	
Management Cost	750,000	1,500,000	
TOTAL PROJECT COST	$ 5,304,900	$ 12,177,100	

Tank Cleaning

In order to neutralize the tankage in preparation for demolition, the tanks will be triple rinsed and the contents removed. The cost for this activity is $203,000. A small contingency of twenty percent for unforeseen circumstances was added for the conservative estimate.

Structural Demolition/Removal

The structural demolition/removal of materials includes the demolition of all structures to grade and clearing the site. It assumes the materials to be disposed (including wood, steel and concrete debris) are acceptable to standard landfills and that most of the work will be completed by non-union labor. The cost is estimated at $1,020,000. A modest contingency factor of fifty percent has been added to include removal of some of the materials as special waste or hazardous waste and the use of special labor. Costs for delaying demolition cannot be estimated.

Asbestos Removal/Disposal

The asbestos removal estimates are based on a visual inspection of the current site condition by an asbestos removal specialist. The largest cost item is the removal/disposal of the asbestos transite panels from the Dice Building ($320,000). A total cost of $486,300 includes the removal and disposal of additional asbestos observed around piping, tanks and building structures. A contingency fee of thirty five percent has been added to include additional asbestos that may be found hidden behind piping and other structures as demolition proceeds. The roof panels of the reduction building may also test positive for asbestos and allowances must be made for that possibility. Before actual asbestos remediation begins, we would recommend a full engineering survey be completed to allow for bidding of the job at competitive rates.

Laboratory Packing/Disposal

There are three primary laboratories onsite that will be packed, shipped and disposed. A rough estimate is provided in that the exact price will be based on what specifically is found, the packing/shipping requirements and disposal requirements. A best estimate price is given at $65,500 with a conservative estimate of $236,000. The best estimate only includes testing, removing and disposing of the labs as packed. **The conservative estimate includes complete lab packing, testing, disposal and removal of gas cylinders.**

Solid Waste Removal/Disposal

Several scenarios are possible for the removal/disposal of solid wastes from the site. Which scenario is chosen will be highly dependent on regulatory agency requirements, which continue to become more restrictive and therefore more costly. In August, for example, there may be a new landfill law in New York and costs will escalate if the current law changes. The estimates assume various disposal options depending on material classification. The cheapest disposal options assume a landfill in Wayne, Michigan for a disposal cost of $115/ton of material while the Model City, New York fill comes in at $200 to $260/ton depending on whether the material is hazardous or non-hazardous. Mr. John Li could take the materials to his plant in Buffalo, and in that case the price would probably be about $35/ton for removal plus transport in bulk or about a third of the best estimate price ($167,000). Therefore, the costs as explained in the Enviropact Study can range from $549,100 to $3,657,000.

Transformers and Articles

The Empire Environmental proposal suggests slightly differing prices for removal/disposal of the transformers and PCB articles onsite. **[illegible] price assumes oil at 500 ppm or less of PCB.** The conservative price assumes a 10,000 ppm PCB concentration which is above the values tested in stored oils onsite.

PCE Dry Cleaning Spill

The PCE organic contamination plume appears to be entering the property from the Northeast from the location of the former Crown-Dyckman Uniforms property. Current estimated cost for a pump and treat option is $250,000 for capital equipment and $85,000 per year operational costs. Two options, a 5 year and 10 year cleanup scenario at $675,000 and $1,100,000 for plume remediation, respectively, are provided. These are speculative costs that will depend on the final design and agency requirements relative to how clean is clean before a clean bill of health can be issued. Obviously, the final cleanup requirements may extend the cleanup period. Since the plume is not a result of Li Tungsten activities, the cost of cleanup would be borne by the owner initially but may be recoverable from the Federal USEPA, State, City or other PRPs.

Mattiace Property Spill

Sampling of the groundwater well placed to the north of the Mattiace property detected organic contamination that is suspected to be moving northward at a depth of 5 feet. The EPA is currently remediating the Mattiace parcel and this cleanup would likely include the parcel to the north of Mattiace. The restrictions that might be placed by NCDOH, may or may not include the prevention of construction of residential units. If the owner is forced to cleanup because of schedules/ requirements, the estimated costs of cleanup are approximated at $125,000 capital cost with a $85,000 per annum cost of operation/testing. This does not include the installation of a slurry wall to contain the Mattiace plume. As in the above example, 5 year and 10 year options are presented as the best and conservative cost estimates but may be extended because of final cleanup requirements.

No. 2 Fuel Oil Spills

The 500,000 gallon fuel tank onsite was placed onsite and leased by Hawkins Fuel Oil. Several spills have been reported and purportedly remediated. Our survey found substantial fuel oil contamination in the soils under the diked area surrounding the tank. The survey also noted a minor oil spill near the Creek at GMW-3 and GMW-5. Both of these spills are noted on Figure E-1. The cost to remediate the soil contamination is estimated by assuming that 1,000 cubic yards are to be removed. Thus, the best estimate price is $150,000 and conservatively 2,000 yards may need to be removed at a cost of $300,000. We would recommend that the excavated material be tested and disposed of via an asphalt processing plant.

Mud Pond Remediation

The mud pond is located just south of the 500,000 gallon fuel tank. The mud pond liner is leaking and therefore the pond area will probably need to be remediated. It is likely that regulatory agencies will be involved in the cleanup and therefore costs and schedules are somewhat speculative. Assuming 5,000 yards of material will need to be removed at $115/yd (best estimate, non-hazardous) and $260/yd (conservative estimate, hazardous), the costs of cleanup are $575,000 and $1,300,000 respectively.

1.5 ESTIMATED TOTAL COST OF SITE REMEDIATION

The total cost of site remediation will be a function of the known elements as well as several unknown elements based on 1987 dollars. The known elements are the first seven items listed in Table E-1 from Liquids/Sludges in Tanks thru Transformer Removal/Disposal. These costs are likely to be fairly accurate estimates with the largest uncertainty being the Solid Materials Removal and Disposal element. To narrow down the range of costs for this option, regulatory agency as well as possible current tenant/owner discussions are necessary.

The unknown elements include the following:

- PCE Spill Remediation
- Mattiace Spill Remediation
- Oil Spill Remediation
- Mud Pond Remediation
- Metals in Groundwater/Soils
- Glen Cove Creek Cleanup

The first three elements on this list are probably attributable to third parties: one of whom is out of business (Crown-Dyckman Uniforms), one of whom is an EPA superfund site owner (Mattiace) and, finally, one who is still in business (Hawkins Fuel Oil). The remaining three are associated, in whole or in part, with activities at the Li Tungsten site over the years it was in operation.

The mud pond remediation costs have been estimated in that it is likely the regulatory agencies will want some remediation of the mud pond before giving the site a clean bill of health. The last two elements of this list, Metals in Groundwater and Glen Cove Creek Cleanup, have not been placed on the remediation cost estimate tabulation. At this point it is impossible to estimate whether these will need to be addressed or if addressed, what level of cleanup will be recommended. This is because tungsten contamination is rare and little information is currently available on health/environmental effects. For example, the health effects standards as well as recommended cleanup procedures for tungsten, have not been established by regulatory agencies. We would anticipate a long and tedious process for the regulatory agencies to accomplish this. Nevertheless, if it is determined that something must be done, RTP recommends that in the process of conducting discussions concerning site remediation with regulatory officials, the two un[redacted]d by the cleanup of Glen Cove Creek and the metal con[redacted] be addressed as discussed below.

Fi[redacted]proposed that an integrated study of Glen Cove Creek be [redacted] regulatory agencies. Second, we suggest that a health effects criteria review for tungsten be performed by an independent consultant with several components. A literature review of health

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effects would be compiled. A draft criteria document would then be prepared establishing the known health effects. Finally, acceptable environmental and health levels would be proposed for use by regulatory agencies to support their decisions on site remediation.

Finally, management/liaison contractors will be necessary to discuss with the owner/state/other parties the variety of cleanup options, to develop specifications and acquire bids, to negotiate cleanup methods, to develop remediation plans, to evaluate bids, to manage site remediation, to perform final testing, to provide legal assistance, etc. These services are estimated to cost $750,000 for completing the necessary tasks to get the site ready for development with a contingency of an additional $750,000 if the likely worst case conditions were to apply.

In summary, based on the information gathered over the course of the site assessment, the total cost of cleanup/remediation including management is $5,304,900, best estimate. By definition, the best estimate price is the likely cost of cleanup, if everything goes according to plan with little leeway for unforeseen problems or delays and basic concurrence by regulatory officials.

The conservative estimate to cleanup/remediate the site is [redacted],100 and accounts for several conditions, terms and items that may cause problems. The largest item in the conservative estimate is the solid waste removal element which is $3.7 million assuming that thirty percent of the materials are removed and disposed of as hazardous materials according to federal and state laws.

Finally, both estimated prices could be reduced substantially under several assumptions.

- Should John Li move materials to his Buffalo Tungsten Facility at \$35/ton the solid waste removal/disposal costs could drop by as much as sixty five percent or more.

- Should EPA/DEC remediate the PCE spill, the actual cost of the project would be only in time/conditions placed on development. Total savings \$675,000 to \$1,100,000, respectively.

- Should EPA/DEC remediate the Mattiace spill, the actual cost of the project would be only in time/conditions placed on development. Total savings \$550,000 to \$975,000, respectively.

- Should EPA/DEC/others remediate the fuel oil spill, the total savings could be \$150,000 to \$300,000, respectively.

- Should the current owner remediate the immediate hazards onsite, cost savings of approximately \$200,000 could be realized on the conservative estimate only.

- Environmental Quality Bond Act monies are potentially available to address the Glen Cove Creek and metals contamination issues.

In conclusion, discussions with Mr. Li, Glen Cove Development Company and regulatory agencies will reveal the likelihood of each of the above potential actions and the probably extent of adjustments to cost estimates.

SECTION 2.0

INTRODUCTION

2.0 INTRODUCTION

2.1 Background.

This report describes the results of an environmental investigation performed at the former site of the Li Tungsten Corporation in Glen Cove, New York. The purpose of the investigation was to evaluate the existence and extent of potential environmental contaminants in order to estimate the appropriate procedures and costs for remediation of the site for residential development.

An aerial photo of the Li Tungsten plant is shown in Figure 1 and provides an overview of the size and complexity of the facility. Figure 2 is a site plan, which defines the major structures and features of the site. During industrial operations at the facility (which began in the 1940's), raw ore and scrap materials processing and smelting operations were conducted to produce tungsten products for sale to industry and the government. A detailed description of tungsten (tungsten alloy properties, tungsten processes, tungsten compounds, tungsten uses, etc.) is presented in the Appendix to this report. RTP has acquired standard aerial photos of the site and they are available as far back as 1950.

Most of the acid extraction, refining and processing operations for tungsten took place on the parcel of property south of Herb Hill Road and east of Garvies Point Road. Here numerous tanks of metal, fiberglass and wooden construction are found both inside and outside the buildings used for processing (Dice Building, East Building and Lounge Building). These were used during extraction, mixing and wastewater treatment operations. Also found on this parcel are offices and chemical laboratories where a

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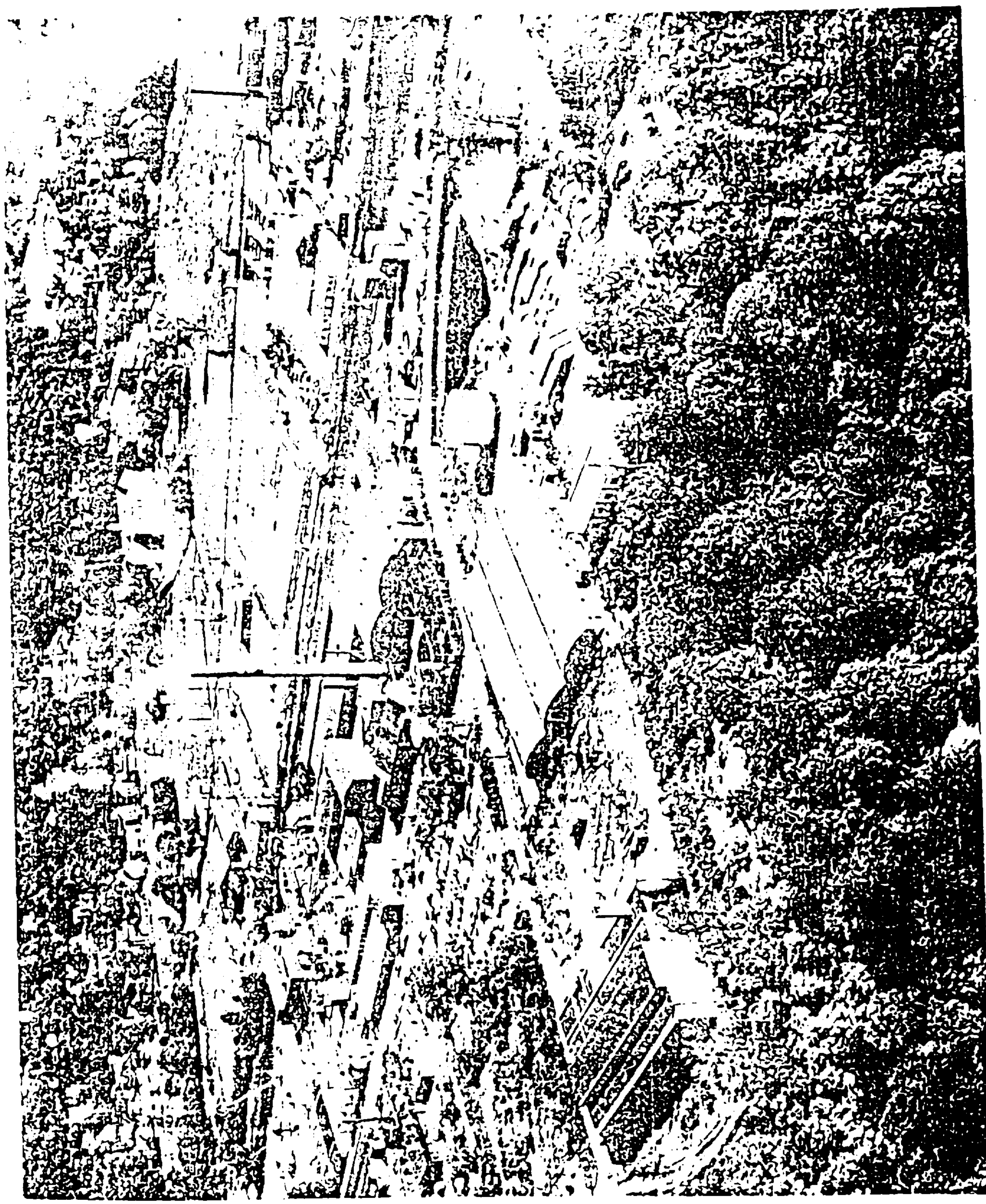


Prepared by RTP Environmental Associates, Inc.

Figure 1. Aerial Photo of Li Tungsten Plant

REFERENCE NO. 5

PRELIMINARY ASSESSMENT
OFF SITE RECONNAISSANCE
INFORMATION REPORTING FORM

Date: 7/20/89

Site Name: LI TUNGSTEN

TDD: 02-8907-78

Site Address: 63 HERB HILL ROAD
Street, Box, etc.

GLEN COVE
Town

NASSAU
County

NEW YORK
State

NUS Personnel:

Name	Discipline
STEVEN OKULEWICZ	GEOLOGIST
DEBORAH COHEN	CHEMICAL ENGINEER

Weather Conditions (clear, cloudy, rain, snow, etc.):
OVERCAST

Estimated wind direction and wind speed: NONE

Estimated temperature: 75°F

Signature: [signature] Date: 7/20/89

Countersigned: [signature] Date: 7/20/89

PRELIMINARY ASSESSMENT

INFORMATION REPORTING FORM

Date: 7/20/89

Site Name: LI TUNGSTEN TDD: 02-8907-28

Site Sketch:

Indicate relative landmark locations (streets, buildings, streams, etc.). Provide locations from which photos are taken.

SEE ATTACHED SHEET

Signature: [signature] Date: 7/20/89

Countersigned: [signature] Date: 7/20/89

103900

PRELIMINARY ASSESSMENT

INFORMATION REPORTING FORM

Date: 7/20/89

Site Name: LI TUNGSTEN TDD: 02-8907-28

Notes (Periodically indicate time of entries in military time):

ARRIVED ON SITE AT 12:00 PM. BACKGROUND READING ON MINI-RAD = 0.01 mR/HR. PARKED VEHICLE ON HERB HILL ROAD NEAR LARGE ABOVE GROUND TANKS, WHICH ARE FENCED OFF WITH 6' CHAIN LINK AND YELLOW CAUTION TAPE. TOOK PHOTO (S1P1) F1. WALKED TO PLANT MAIN ENTRANCE GATE WHICH WAS PADLOCKED. SAW RUSTING STACKED 55-GALLON DRUMS AND WOODEN PALLETS. BUILDINGS ~~WI~~ WINDOWS ARE BOARDED UP BUT SOME DOORS ARE OPEN. TOOK PHOTOS OF SIGN (S2P2) (F2) AND STACKED DRUMS (S2P3) (F3). STARTING TO RAIN. MOVED VEHICLE TO GARVIES POINT ROAD ACROSS FROM HAWKINS FUEL COMPANY. PARKED NEXT TO MUD POND WHICH IS FENCED OFF FROM VIEW BY 6' WOODEN FENCE. SOIL ~~AR~~ BETWEEN FENCE AND RUNWAY IS BLACKENED AND STAINED, ALSO SMELLS "ORGANIC". TOOK PHOTO (S4P4) OF MONITORING WELL IN FRONT OF FENCE AND MUD POND (F4). PHOTO OF WAREHOUSE BUILDING NEXT TO HAWKINS FUEL OIL COMPANY (S5P5) (F5), WELL # EMW-4, PADLOCKED. MOVED VEHICLE TO CORNER OF HERB HILL ROAD AND DICKSON LANE. PHOTO OF MONITORING WELL GM-8 IN AREA OF ABOVE GROUND TANKS - FENCED OFF. PHOTO (F6) (S6P6). NO PILES SEEN IN THIS AREA. STORM DRAINS ALONG HERB HILL ROAD.

Signature: [signature] Date: 7/20/89

Countersignature: [signature] Date: 7/20/89

PRELIMINARY ASSESSMENT

INFORMATION REPORTING FORM

Date: 7/20/89

Site Name: LI TUNGSTEN TDD: 02-8907-38

Notes (Cont'd):

TOOK PHOTO OF ENTRANCE TO NEW WAREHOUSE BUILDING THROUGH CHAIN LINK FENCE (PHOTO 5997 F7). PHOTO 5998 (F8) OF GREY 30-GALLON DRUMS STACKED ABOVE WOODEN FENCE ON CORNER OF HERB HILL ROAD (SE CORNER) AT INTERSECTION. MOVED VEHICLE NORTH ALONG DICKSON LANE AND PARKED ACROSS FROM REDUCTION BUILDING. TOOK PHOTO OF 5000 P10 (F10) UNCOVERED, BLACK, FINE GRAINED PILES (3 IN NUMBER) APPROXIMATELY 50 FEET FROM ROADWAY (DICKSON LANE) ON EAST SIDE OF ROAD. PHOTO 5999 (F9) OF ENTRANCE TO OPEN REDUCTION BUILDING SHOWING 55-GALLON RUSTED DRUMS. NO READINGS ABOVE BACKGROUND ON MINI-RAD. LEFT SITE AT 1:00 P.M. (EASIER ACCESS TO SITE ALONG LANDING ROAD AND MAKE LEFT TURN TO ELLWOOD AVE).

Attach additional sheets if necessary. Provide site name, TDD number, signature, and countersignature on each.

Signature: [signature] Date: 7/20/89

Countersignature: [signature] Date: 7/20/89

PRELIMINARY ASSESSMENT

INFORMATION REPORTING FORM

Date: 7/20/89

Site Name: LI TUNGSTEN TDD: 02-8907-28

Photolog: DEBORAH COHEN - PHOTOGRAPHER

Frame/Photo Number	Date	Time	Photographer	Description
F1 (S1P1)	7/20/89	1:05	D.C.	— VIEW OF ABOVE GROUND TANKS LOOKING NORTH ON WEBB HILL ROAD.
F2 (S2P2)	7/20/89	12:09	D.C.	— MAIN ENTRANCE OF LI TUNGSTEN—SIGN - SOUTH VIEW
F3 (S3P3)	7/20/89	12:10	D.C.	— STACKED DRUMS, HOLDEN PAD IN MAIN ENTRANCE, SOUTH VIEW
F4 (S4P4)	7/20/89	12:20	D.C.	— MUD POND, MONITORING WELL SCARRED VEGETATION, NORTH VIEW
F5 (S5P5)	7/20/89	12:21	D.C.	— LI WAREHOUSE AND ADJACENT HAWKINS FUEL CO. SE VIEW
F6 (S6P6)	7/20/89	12:30	D.C.	— EAST VIEW OF AREA IN FRONT OF TANKS AND MONITORING WELL GM-8.
F7 (S7P7)	7/20/89	12:31	D.C.	— ENTRANCE TO NEW WAREHOUSE BLDG. SHOWING OPEN DOORS - DRUMS GREY STACKED DRUMS ON CORNER
F8 (S8P8)	7/20/89	12:37	D.C.	— SE VIEW OF HAWKINS CORNER
F9 (S9P9)	7/20/89	12:53	D.C.	— ENTRANCE TO REDUCTION BLDG. SHOWING DRUMS
F10 (S10P10)	7/20/89	1:00	D.C.	— OPEN WASTE PILE ON EAST SIDE OF DICKSON LANE

Attach additional sheets if necessary. Provide site name, TDD number, signature, and countersignature on each.

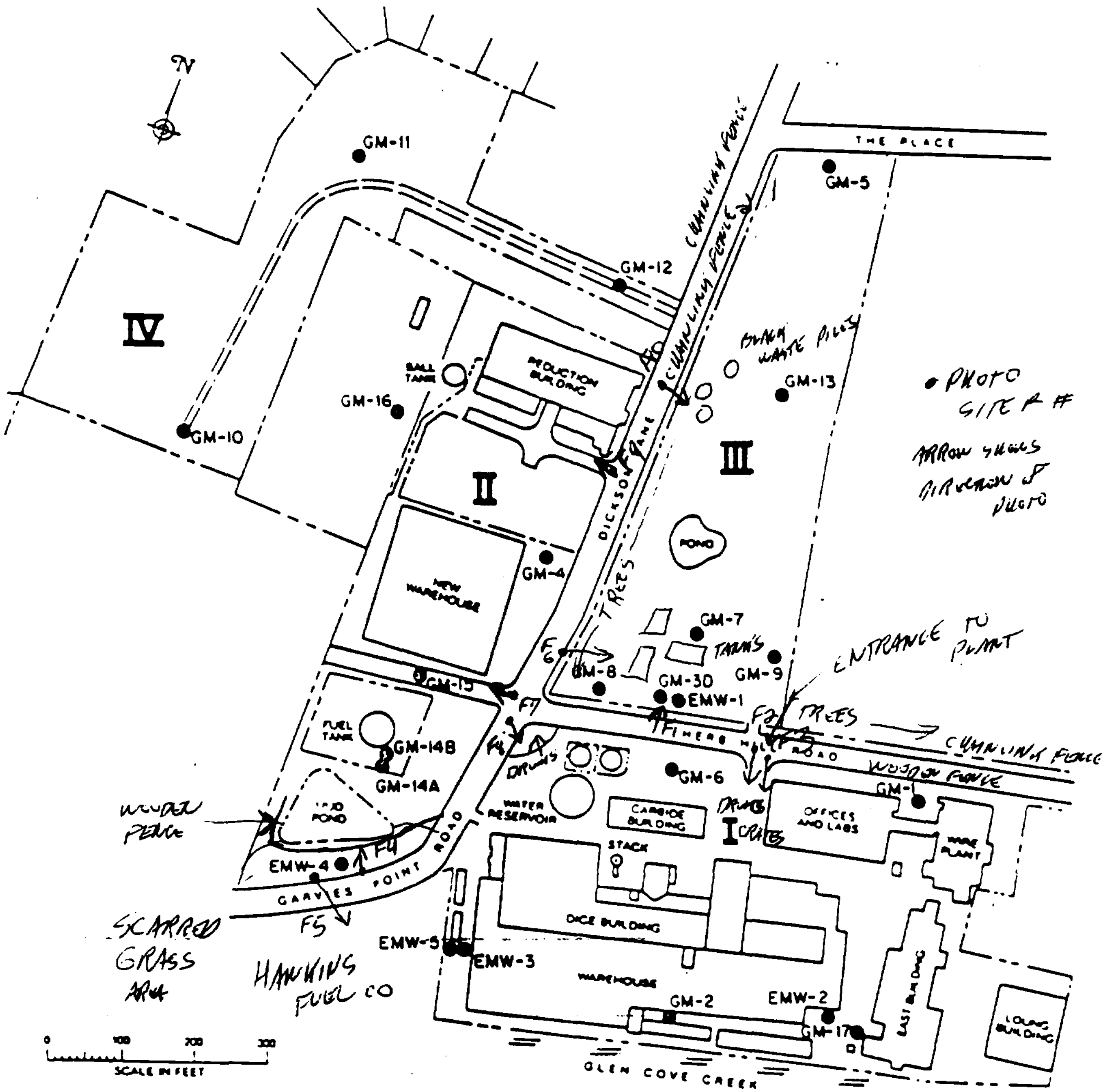
Signature: [signature] Date: 7/20/89

Countersignature: [signature] Date: 7/20/89

LI TUNGSTEN

GERAGHTY & MILLER, INC.
Ground-Water Consultants

COMPILED BY: V. GLASSER	DATE: 4-88	SCALE: SHOWN	PREPARED FOR:	RTP ENVIRONMENTAL ASSOC., INC. Glen Cove, New York
PREPARED BY: G. SCHAFFNER	FILE NO: N1342L11-1047			
PROJECT MGR: V. GLASSER				



EXPLANATION

II	PARCEL NUMBER	●	MONITORING WELL LOCATION
— - - —	PROPERTY/PARCEL BOUNDARY	═══	DIRT ROAD

SUBJECT

LOCATION OF MONITORING WELLS, LI TUNGSTEN FACILITY, GLEN COVE, NEW YORK

FIGURE 2

103904

REFERENCE NO. 6

REFERENCE NO. 7

New York

N. Y.—CONN.—N. J.

1:250 000-scale map of

Atlantic Coast Ecological Inventory

Produced by
U. S. FISH AND WILDLIFE SERVICE
1980

103907

436 Bitterns
437 Great blue heron (S)
438 Wood ibis (S)
439 Anhinga
440 Little blue heron (S)
441 Yellow-crowned night heron (S)
442 Black-crowned night heron
443 Florida sandhill crane (S)
444 Louisiana heron (S)
445 Limpkin (S)
446 Roseate spoonbill (S)
447 Snowy egret (S)
448 Magnificent frigate-bird (S)
449 Reddish egret (S)
450 Clapper rail
451 King rail
452 Virginia rail
453 Sora rail

WATERFOWL (461-500)
461 Waterfowl
462 Swans
463 Geese
464 Dabbling ducks
465 Diving ducks
466 Common eider
467 Harlequin duck
468 Wood duck
469 Fulvous tree duck
470 Loons
471 Grebes
472 Brant geese
473 Snow goose
474 Gadwall
475 Black duck

RAPTORS (501-530)
501 Raptors
502 Owls
503 Kites
504 Hawks
505 Bald eagle (F)
506 Osprey (S)
507 Peregrine falcon (F)
508 Copper's hawk (S)
509 Swallow-tailed kite
510 Marsh hawk (S)
511 Southeastern American kestrel (S)
512 Florida burrowing owl (S)

SEABIRDS (531-550)
531 Seabirds
532 Petrels, shearwaters, and albatroses
533 Pelican and allies
534 Alcids
535 Brown pelican (F)
536 Black guillemot
537 Leach's petrel
538 Razorbill
539 Common puffin
540 Double-crested cormorant
541 Gannet
542 Wilson's petrel
543 Northern phalarope
544 Audubon's shearwater
545 Greater shearwater
546 Shearwaters
547 Petrels
548 Jaegers
549 White pelican

SONGBIRDS AND OTHERS (551-600)
551 Songbirds and others
552 Red-cockaded woodpecker (F)
553 Chachalaca
554 Bachman's warbler (F)
555 Wild turkey
556 American woodcock
557 Pileated woodpecker
558 Swainson's warbler
559 Ruffed grouse
560 Bobwhite
561 Mourning dove
562 Warblers
563 Ring-necked pheasant
564 Bank swallow
565 Dusky seaside sparrow (F)
566 White-crowned pigeon (S)

REPTILES AND AMPHIBIANS (601-700)
601 Eastern narrow-mouthed toad (S)
602 Eastern indigo snake (F)
603 American alligator (F)
604 Northern diamondback terrapin
605 Amphibians
606 Greater siren
607 Bog turtle (S)
608 Gopher tortoise (S)
609 Eastern tiger salamander (S)
610 Northern fence lizard
611 Five-lined skink
612 Map turtle
613 Plymouth red-bellied turtle (F)
614 Eastern diamondback rattlesnake
615 Carolina gopher frog
616 Florida gopher frog (S)
617 Atlantic salt marsh watersnake (F)
618 American crocodile (F)
619 Florida Keys mole skink (S)
620 Florida black-headed snake (S)
621 Pine barrens tree frog (S)
622 Northern pine snake (S)
623 Corn snake (S)
624 Timber rattlesnake (S)
625 Southern gray tree frog (S)

MAMMALS (701-800)
701 Beaver
702 Whitetail deer

AQUATIC ORGANISMS

Shown in BLUE, species with special status shown in RED-(F) or (S) indicates species protected by Federal or State Legislation (see text)

SYMBOL SPECIES

PLANTS (1-50)
1 Irish moss
2 Rockweed

INVERTEBRATES (51-100)
51 Crabs
52 Mussels
53 Oysters
54 Scallops
55 Clams
56 Worms
57 Shrimp
58 American lobster
59 Blue crab
60 Eastern oyster
61 European oyster
62 Bay scallop
63 Deep-sea scallop
64 Calico scallop
65 Surf clam
66 Hard clam
67 Soft shell clam
68 Brackish-water clam
69 Bloodworm
70 Sandworm
71 White shrimp
72 Brown shrimp
73 Northern shrimp
74 Rock crab
75 Jonah crab
76 Whelk
77 Ocean quahog
78 Pink shrimp
79 Stone crab
80 Spiny lobster

FISH (101-200)
101 Sharks, skates, rays
102 Herring
103 Salmon and trout
104 Catfish
105 Cod
106 Sunfish and bass
107 Drum
108 Flatfish
109 Longnose gar
110 Shortnose sturgeon (F)
111 Atlantic sturgeon (S)
112 American eel
113 Blueback herring
114 Hickory shad
115 Alewife
116 American shad (S)
117 Atlantic menhaden
118 Atlantic herring
119 Gizzard shad
120 Tarpon
121 Atlantic salmon
122 White catfish
123 Channel catfish
124 Yellow bullhead
125 Brown bullhead
126 Flat bullhead
127 Sea catfish
128 White perch
129 Striped bass
130 Black sea bass
131 Redbreast sunfish
132 Warmouth
133 Bluegill
134 Largemouth bass
135 Black crappie
136 Sheepshead
137 Spotted seatrout
138 Weakfish
139 Spot
140 Atlantic croaker
141 Southern kingfish
142 Northern kingfish
143 Gulf kingfish
144 Red drum
145 Star drum
146 Black drum
147 Summer flounder
148 Southern flounder
149 Winter flounder
150 Rainbow smelt
151 Atlantic tomcod
152 Threadfin shad
153 Carp
154 Atlantic mackerel
155 Chain pickerel
156 White bass
157 Northern puffer
158 Silver perch
159 Florida pompano
160 Bluefish
161 Spanish mackerel
162 Cobia
163 Mullet
164 White crappie
165 Redear sunfish
166 Smallmouth bass
167 Yellow perch
168 Pumpkinseed
169 Atlantic halibut
170 Atlantic cod
171 Pollock
172 Hadd[illegible]

ovo-00

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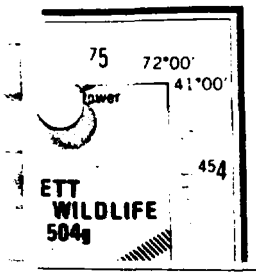
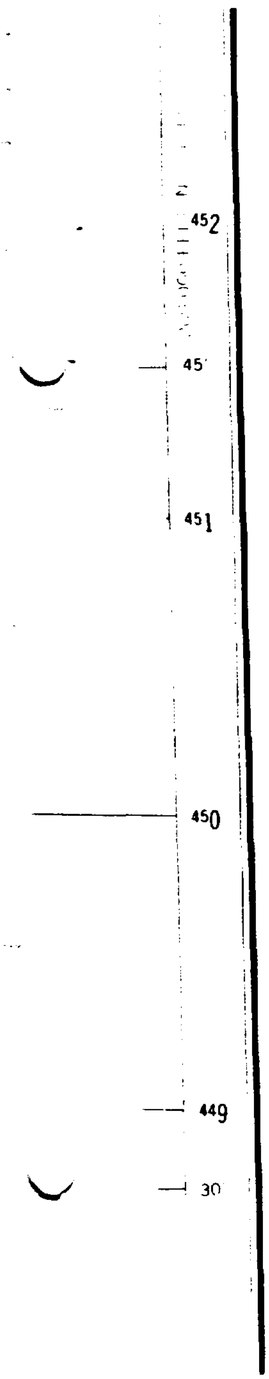


HABITAT USE

Shown in RED for species with special status, BLUE for aquatic organisms and BROWN for terrestrial organisms

- a Spawning ground
- b Nursery
- c Commercial harvesting area
- d Adult concentration
- e Overwintering area
- f Sport fishing/hunting area
- g Migratory area
- h Nesting area
- i Unusual distribution or specimen



TERRESTRIAL ORGANISMS

Shown in BROWN; species with special status shown in RED-(F) or (S) indicates species protected by Federal or State Legislation (see text)

SYMBOL SPECIES

PLANTS (301–350)

301 Eastern hemlock
302 Spleenwort (S)
303 Spider lily (S)
304 Pond bush (S)
305 Watermilfoil (S)
306 Hooded pitcher plant (S)
307 Tree
308 Prickly pear cactus (S)
309 Trailing arbutus (S)
310 Eastern bumelia
311 Pitcher plant
312 Baldcypress
313 Redbay
314 Seaside alder
315 Box huckleberry
316 Purple fringeless orchid
317 Pink lady's slipper
318 Ebony spleenwort (S)
319 Orchids (S)
320 Golden club (S)
321 Florida beargrass
322 East-coast coontie
323 Fall-flowering ixia
324 Jackson-vine
325 Spoon-flower
326 Curtiss milkweed
327 Sea lavender
328 Hand fern
329 Needle palm
330 Yellow squirrel-banana
331 Beach creeper
332 Florida coontie
333 Four-petal pawpaw
334 Bird's nest spleenwort
335 Burrowing four-o'clock
336 Beach star
337 Silver palm
338 Dancing lady orchid
339 Tamarindillo
340 Fuch's bromeliad
341 Everglades peperomia
342 Buccaneer palm
343 Slender spleenwort
344 Pineland jacquemontia
345 Mahogany mistletoe
346 Florida thatch
347 Twisted air plant
348 Long's bittercress
349 Venus's flytrap

INVERTEBRATES (351–400)

351 Monarch butterfly
352 Zebra butterfly

BIRDS (401–600)

SHOREBIRDS (401–430)

401 Shorebirds
402 Terns
403 Gulls
404 Forster's tern
405 Arctic tern
406 Least tern (S)
407 Roseate tern (S)
408 Common tern
409 Great black-backed gull
410 Herring gull
411 Laughing gull
412 Black skimmer (S)
413 Turnstones
414 Plovers
415 Piping plover
416 American oystercatcher (S)

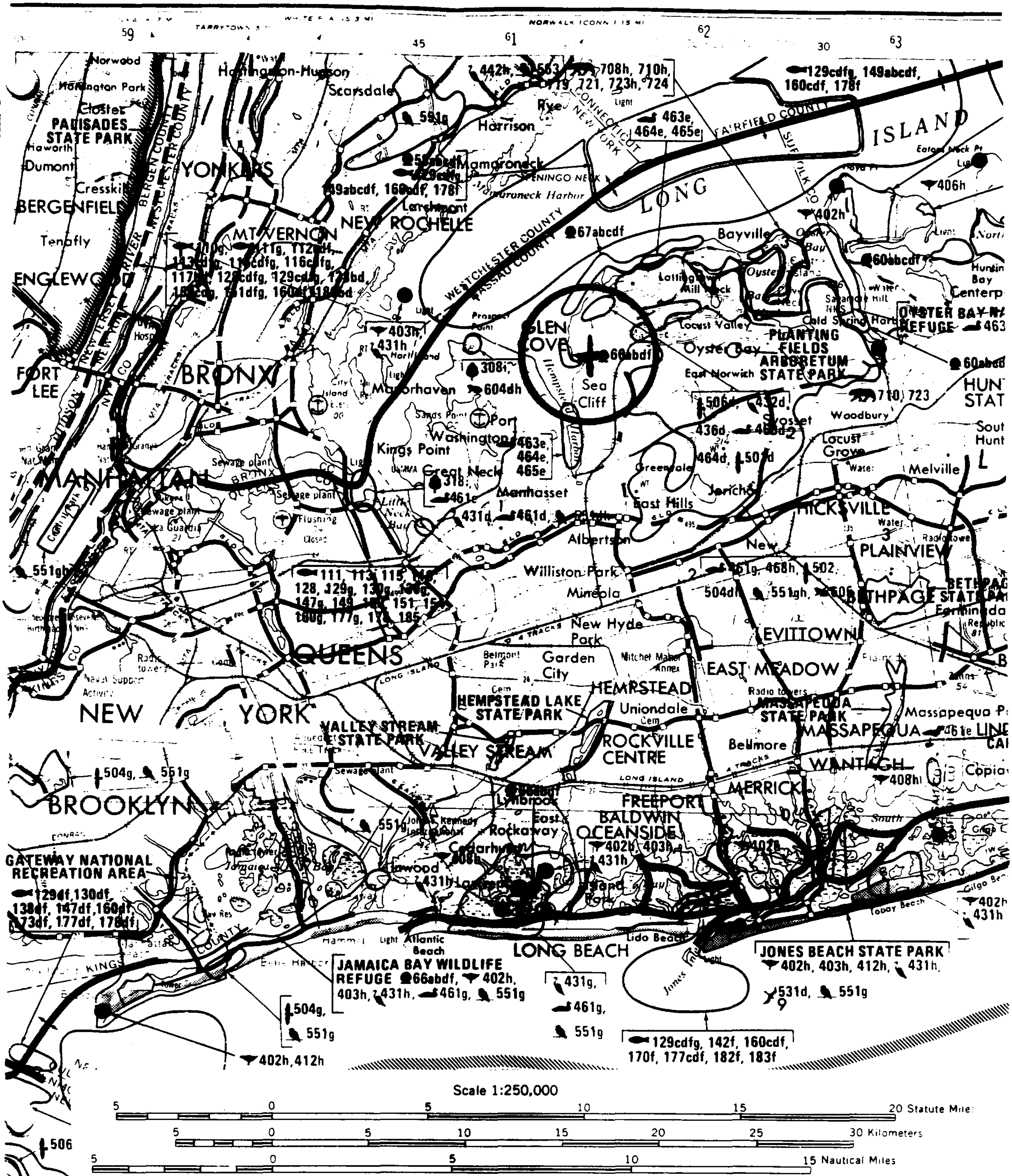
WADING BIRDS (431–460)

431 Wading birds
432 Herons
433 Egrets
434 Rails
435 Ibises
436 Bitterns
437 Great blue heron (S)
438 Wood ibis (S)
439 Anhinga
440 Little blue heron (S)
441 Yellow-crowned night heron (S)
442 Black-crowned night heron
443 Florida sandhill crane (S)
444 Louisiana heron (S)
445 Limpkin (S)
446 Roseate spoonbill (S)
447 Snowy egret (S)
448 Magnificent frigate-bird (S)
449 Reddish egret (S)
450 Clapper rail
451 King rail
452 Virginia rail
453 Sora rail

WATERFOWL (461–500)

461 Waterfowl
462 Swans
463 Geese
464 Dabbling ducks
465 Diving ducks
466 Common eider
467 Harlequin duck
468 Wood duck
469 Fulvous tree duck

103909



TRANSVERSE MERCATOR PROJECTION

BLACK NUMBERED LINES INDICATE THE 10,000 METER UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 18

103910

REFERENCE NO. 8

WASTE CHARACTERIZATION REPORT

LI TUNGSTEN SITE

GLEN COVE, NEW YORK

PREPARED FOR

RTP ENVIRONMENTAL ASSOCIATES, INC.
400 POST AVENUE
WESTBURY, NEW YORK 11590

PREPARED BY

ENVIROPACT NORTHEAST, INC.
540 PALMER ROAD
YONKERS, NEW YORK 10701

APRIL 29, 1988

VOLUME I

1.2 SITE DESCRIPTION AND LOCATION

The Li Tungsten facility (Figure 1), located in Glen Cove, New York, consists of several parcels of land, approximately 20 acres in size. Due to the size of the property and for the purpose of reporting data, the parcels were specifically identified as follows:

* Area A is located south of Herb Hill Road and east of Garvies Point Road. Five buildings are located in this area. However for sampling purposes, Area A represents only the outdoor areas (Figure 2).

* Area D refers to the Dice Building, a warehouse which is located on the southern side of Area A. The south wall of the Dice Building is bordered by the Glen Cove Creek. All sampling was done inside the building (Figure 2).

* Area B is located to the east of Dickson Lane and north of Herb Hill Road. The area is presently used as a parking lot to the south and is mostly wooded to the north. There are no buildings located in this area (Figure 3).

* Area C refers to the parcel of land west of Dickson Lane and north of Garvies Point Road. There are two buildings on this property; the New Warehouse and the Reduction Building. On the south end there is a lined lagoon. Just north of the lagoon is a large fuel tank (Figure 4).

2.0 FIELD EFFORT

2.1 SITE RECONNAISSANCE

2.1.1 HEALTH & SAFETY

Due to the current condition of the site, a health and safety plan, identifying the expected hazardous material and levels of safety necessary to protect the health and safety of Enviropact Northeast, Inc. field personnel was developed (Attachment 2).

2.1.2 SUMMARY OF SITE RECONNAISSANCE

A preliminary site reconnaissance was performed on March 25, 1988 to identify the solid waste on site in order to ascertain the type of material that would be included in the inventory. This inspection was performed by two Enviropact Northeast, Inc. personnel, a representative of RTP Environmental Associates, Inc. and a representative of Li Tungsten, the former site owner. During the inspection the Li Tungsten representative pointed out materials on site which would require disposal and material which would be retained by the previous owner. As a result of this inspection the following solid wastes were identified for disposal:

(a) In area A (Figure 2), drums, crates and piles were identified outside of buildings. The majority of this material was located on the north side of the Dice building, the south side of the Carbide building, and adjacent to the East Building. Additional material was also stored along the property fence on the corner of Herb Hill Rd. and Garvies Point Road. The material was primarily stored in 55 and 30 gallon drums, many of which had corroded with their contents spilling on the concrete pavement. Liquid drums were also dispersed throughout the area, however the Li Tungsten representative could not identify their contents, but assured us that they did not contain organics a statement which was later found to be inaccurate.

(b) Inspection of the Loung building indicated the presence of asbestos. All 30 gallon drums stored in this building were empty according to the Li Tungsten representative. Upon examination this was confirmed.

(c) Inspection of the East building indicated the presence of numerous tanks but no solid waste or any other type of solid materials. The area inside this building was flooded with water.

(d) The Li Tungsten representative was asked on several occasion if chemicals other than those stored in the tanks were present on site. He repeatedly denied that any type of chemical, organic or non-organic, was being stored on site and did not identify the laboratory area as an area of concern.

(e) The inspection of the Dice and Warehouse Building, area D (Figure 2), revealed the warehousing of large quantities of processed ore. Most of this material was stored in 55 and 30 gallon drums, and crates. The material seemed to be stored in lots identified by I.D. numbers. The Li Tungsten representative was asked if quantities could be retrieved by lot number. His response was that it would be time consuming and that much of the information was not available on site. Many of the drums showed signs of corrosion, especially in areas were flooding had occurred. Much of the material had spilled onto the floor. Drums were dangerously stacked three and four drums high, and close together, making access for sampling a problem. The Li Tungsten representative estimated that approximately 1 million pounds of processed ore was being warehoused in this building. Some of the material was being prepared for shipment, but no indication was given as to what specific lots would be removed. Overall this building contained the major portion of the solid waste which would need to be disposed of.

(f) Opposite and to the south of the Dice Building there is a partially covered storage area. This area is being used to store old equipment with no evidence of solid waste was being stored.

(g) The Carbide building contained no solid waste. On the outside of this building facing Herb Hill Road, several transformers were identified. The Li Tungsten representative was asked if the transformer oil had been recentlv tested. He indicated that some transformers had been tested and that he would provide RTP this information.

(h) Three concrete settling tanks were identified on the west side of the Dice building. According to the Li Tungsten representative these received processed water from the Dice Building which was then transferred to the lagoon located in area C across the road.

(i) Three outfalls were referred to, but not identified. The Li Tungsten representative was asked to provide the old SPDES permit. Examination of the permit indicated that the facility was required to monitor 17 parameters including pH and heavy metals.

(j) Area C (Figure 4), west of Dickson Lane was also inspected. In this area a lagoon and two small mud holes were identified as having received process water from the facility. The lagoon was lined and partially covered with what was assumed to be rain water. Upon closer inspection of the liner it was apparent that it had been perforated by vegetative growth. The lagoon contained sludge that had apparently settled out during previous years. The two small mud holes also showed signs of having received discharge during previous years.

(k) The New Warehouse building also located in area C was inspected. The building is used to store large quantities of materials which according to the Li Tungsten representative will be removed and retained by the former owner. Based on his instruction no attempt was made to identify the type of material located in this building.

(l) Outside the New Warehouse building quantities of materials similar to those previously identified in area A and D were identified and inspected. The material are stored along the south, west and east walls of the building in crates and 55 gallon drums. It was indicated that these materials would need to be inventoried and disposed of. Outside and east of the building in question several transformers were also identified .

(m) The Reduction building houses the refractory furnaces. No solid waste or other types of solid materials were identified. Outside this building several transformers were also identified.

(n) West of the Reduction building the landscape slopes upward to an area where additional material was identified. This material was identified as wastes from the refractory furnaces by the Li Tungsten representative. Although the landscape naturally slopes upward in the surrounding area it would appear that past disposal practices had created a sizeable man made mound. At the summit of this mound, several piles of distinctly colored material were also identified. No additional information was provided on the extent of filling that was performed in this area in the past.

(o) Across the street from the Reduction Building and new Warehouse Building is a vacant lot referred to as area B. The area is partially wooded to the north, with clearings spotted throughout. At one such clearing which can be seen from the road, seven piles of material similar to those reported in area C were identified. Apparently this area also had been partially filled, since it did not conform with the general slope of the landscape. A clearing to the south and adjacent to Herbhill Rd. formerly used as a parking area by Li Tungsten employees is presently being used to store junked cars. The drainage in this area is to the south. Overland runoff is captured by an intermittant creek that empties into a small pond.

2.2 INVENTORY OF WASTE

Based on this preliminary reconnaissance, Enviropact Northeast formulated its approach to conduct a comprehensive inventory of the solid waste material that would require disposal. The approach entailed the enumeration of all drums and crates, and measurements of piles to determine approximate volumes. The inventory was performed in conjunction with the sampling effort in order to save time. A team of three Enviropact personnel which consisted of a chemist, a remediation expert and a technician performed the inventory and collected samples of the materials previously identified. In addition to making an inventory of the solid waste the team identified and enumerated drums containing liquids. These drums were not sampled. The base map indicates the location of the material inventoried (Figures 5 through 8). The result of the inventory is found in Tables 1 through 4.

2.2.1 SOLIDS

AREA A

A physical inventory of the number of drums, crates, and piles of material was made. Approximately 155 crates, 826 fifty-five gallon drums (Figure 5), and 480 thirty gallon drums were counted in this area. Based on the capacity of these containers, estimated volumes (cubic yards) were developed and converted to tons by multiplying by a weight factor of 1.5 tons/cu. yd. The only exception was A-12, where boundaries and height of the waste were used to determine volumes. As a result, the total volume and tonnage in area A was estimated to be 942 cu. yds. and 1413 tons, respectively. (See Table 1.)

AREA D

A physical inventory of the number of drums, crates, and piles of material was made (Figure 8). Approximately 288 crates, 2726 fifty-five gallon drums, and 3,823 thirty gallon drums were counted in this area. Total volume and tonnage was determined as previously described in Area A. As a result, the total volume and tonnage in Area D was estimated to be 1,588 cu. yds. and 2,382 tons, respectively (See Table 2).

AREA B

As previously described, the bulk of the material in this area was either in piles or landfill. In view of this situation, Enviropact requested that a surveyor develop estimated volumes for this area. As a result of the surveyor's input, approximately 325 cu. yds. were estimated for the seven piles of material, and 6,000 cu. yds. for the landfill area west of the intermittent creek, and north of the pond (Figure 6). Using the weight conversion factor, approximately 9500 tons of material has been identified in this area (See Table 3).

AREA C

The two major sources of material in this area were identified in crates and drums, and in a filled-in area behind the Carbide Building (Figure 7). Approximately 276 crates and 197 fifty-five gallon drums were counted outside the New Warehouse Building. As a result of the surveyor's input, it was estimated that approximately 2000 cu. yds. of filled material may be found in Area C. Using the weight conversion factor, approximately 3494 tons of material has been identified in this area. (See Table 4.)

2.2.2 LIQUIDS

Although not in the original scope of work, Enviropact conducted a preliminary inventory of liquids in drums throughout the site. A total of 64 fifty-five gallon drums were identified in Area "A". In area "D" a total of 37 fifty-five gallon drums and 30 thirty gallon drums were identified as containing liquids. With the exception of the 30 drums which were tested for P.C.B., all other drums contents were not analyzed. Many of these drums showed signs of deterioration.

Also not included in the original scope of work was the cost estimate for the disposal of the liquids in the tanks. Table 5, to the best of our knowledge, summarizes the results of the a liquid inventory conducted by American Environmental-Technologies Corp. Based on their inventory, 64 tanks were identified to contain 312,000 gallons of liquid material. In addition to the 69 tanks which had been identified by contents and volume of contents, approximately 67 could not be included in our inventory because of unavailable information on current contents and volumes. It should be noted that the bulk of the tanks were located in areas A and D.

2.2.3 MISCELLANEOUS WASTE

At the request of RTP, Enviropact conducted a preliminary inventory and review of areas needing immediate action. These areas of concern were identified by RTP. Subsequently, Enviropact was asked to develop cost estimates for corrective action. The following areas were identified as needing immediate action:

(a) Secure lab chemicals located in office/lab building. Approximately 9,500 sq. ft. of laboratory space was used to store various types of laboratory chemicals. The chemicals are in liquid and solid form and are contained in glass bottles and large bulk drums. Because the building roof is rapidly deteriorating, ceiling tiles are coming down on chemical containers causing spillage and emission of dangerous vapors. No inventory of the laboratory chemicals was made, since the area was considered unsafe and outside the original scope of work. In view of this situation, cost estimates were made based on a visual inspection of the area.

(b) Drum overpacking of all drums containing liquids assumed to be organic, located throughout the site as noted in Table 6. A preliminary inventory conducted by Enviropact identified 101 fifty-five gallon drums needing to be repacked and 30 thirty gallon drums that needed their liquid contents to be transferred to fifty-five gallon drums.

(c) Removal and disposal of water covering the floor of the Dice Building and East Building. It was estimated that approximately 19,000 gallons would require removal and disposal. Samples collected indicated pH range of 6 to 6.5, with high nickel content (>4000 ppm).

(d) Secure and dispose of gas cylinders located in the office and laboratory area. A preliminary inventory provided by RTP, indicated the presence of 22 cylinders; their contents including hydrogen sulfide and chlorine gas.

(e) The immediate transfer and/or disposal of approximately 129,000 gallons of liquids from tanks which were identified by AET as deteriorating to a point of possible leakage. The evaluation of tank conditions was not performed by Enviropact, and we assume no responsibility for the accuracy of this assessment. The tanks must also be triple rinsed before they can be dismantled and disposed of. The rinse water (approximately 25,000 gallons) will need to be disposed of accordingly.

(f) Cover lagoon area with liner in order to eliminate the percolation of rain water through sludge material in the lagoon.

2.3 SAMPLE COLLECTION

Samples collected throughout the site are identified on Figures 5 through 9, depending on the area sampled. Approximately 200 samples were collected across the site for various analyses.

2.3.1 CONTAINERIZED SOLID WASTE SAMPLES

Materials in areas A, C and D, found in either drums or crates, were sampled for metals analysis. These were collected in plastic bags, using plastic or P.V.C. sampling equipment to remove material from the containers. Most of these materials were stored in lots. The sampling attempted to acquire a representative sample for each lot encountered. Where lot sizes were unclear, Enviropact personnel established physical boundaries for sampling purposes.

Materials in area A were badly weathered. Many drums and crates were collapsed, resulting in materials deposited on the ground. Samples A-1 through A-24e were collected in this area, (Figure 5).

Materials in area C were also badly weathered and discharging their contents directly to the ground. Samples C-15, C-16 and C-20 were collected in this are, (Figure 7).

Materials in area D were located throughout the Dice Building. The samples taken in this area displayed a greater variety in physical appearance (color, consistency, etc.). Many stacks of drums had toppled over, and many more gave the appearance that they could fall at any time. This situation made sampling very difficult and dangerous. Representative samples, by lot, were collected in area D, with some samples apparently representing raw materials (See Table 2). Samples D-1 through D-113 were collected in this area. (Figure 8)

2.3.2 WASTE PILE SAMPLES

Materials in areas B and C appear to have been landfilled from the Li Tungsten operation. These materials appear to differ by color and consistency for each pile. They also appear to be different from the processed material predominant throughout areas A and D. A composite of each pile was made by collecting multiple surface samples of visually similar material.

Piles in area B were also sampled as previously described. Samples B-1 through B-7 were collected in this area. An area south of these samples, currently used to store old tanks and tank trucks, may also have been subjected to some landfilling. Sample B-10 was collected in this area. (Figure 6)

2.3.3 P.C.B. SAMPLES

Grab samples were collected throughout the site in those areas where P.C.B. contamination was thought to be a concern. All samples were collected in 40 ml. septum vials. Due to the age of the transformers on site, it was anticipated that they would contain P.C.B. Five samples, A-53, A-58, A-64, C-21 and D-99 were collected for P.C.B. analysis (Figures 5, 7 and 8). Additionally, a P.C.B. sample was collected from some open-head, 30 gallon drums located inside the Dice Building and the oil recovery sump to th west of the Dice Building.

2.3.4 VOLATILE ORGANICS SAMPLES

Grab samples were collected throughout the site in those areas where volatile organics contamination was thought to be a concern. All samples were collected in 40 ml. septum vials. A total of 26 samples were collected for VOC across the site. These include samples A-50 through A-63, A-8, B-9, B-10, C-1, C-5, C-11, C-12, C-18, C-19, C-21, D-9 and D-94. (See Figures 5 through 8.)

2.3.5 PRIORITY POLLUTANT SAMPLES

Grab samples were collected from four locations across the site (Figure 9). These sample locations were selected based on their ability to reflect potential contamination resulting from the facility's past activities. All samples were collected in glassware cleaned to E.P.A. specifications.

2.3.6 RADIOCHEMICAL SAMPLES

Three samples were composited from various waste containers in area A and area D to determine the radioactive potential of the wastes on site.

2.3.7 OUTFALL SAMPLES

Samples were collected at the east and west outfalls (004 and 005) entering Glen Cove Creek. Due to the inactivity of the outfalls themselves, sediment samples were collected directly below each outfall. A metal dredge was used to collect the organic samples and a PVC rod was used to collect the metal samples.

2.3.8 MISCELLANEOUS SAMPLES

Additional samples were collected throughout the site in areas of general concern, i.e., lagoons, drainage areas, etc.

3.0 DISCUSSION OF ANALYTICAL RESULTS

3.1 WASTE CHARACTERIZATION

The characterization of solid waste as hazardous was performed in accordance to R.C.R.A. definitions of the term "hazardous waste". According to this definition, any solid waste that is either ignitable, corrosive, reactive or toxic is considered hazardous. Each characteristic is defined in complex and comprehensive terms. Some substances are mentioned by name. Other materials are identified by the industrial process in which they are produced.

The actual rules are complicated and voluminous; in order to make the regulatory criteria specific, so that coverage is broad enough, but no broader than necessary to insure public safety and environmental protection. The present consensus within the regulatory community is that, where the regulators erred, they erred on the side of caution, resolving uncertainties in favor of inclusion rather than exclusion. Since the burden of finding out whether a material is covered by the definition falls solely on the regulated party, uncertainties have to be resolved according to applicable standards.

With regard to the solid material located on site, the determination of its potential hazardous nature was based on the results of the analysis for the 8 R.C.R.A. metals and the Extraction Procedure Toxicity (40CFR 261.24(a)). Toxicity has a special and very precise meaning in the context of characteristic wastes. The regulations contain a list of fourteen substances which, if present in an extract of the materal sampled at threshold concentrations, render the entire waste stream subject to regulation as a hazardous waste. A list of the prominent metals and their thresholds is found below:

TABLE 7

MAXIMUM CONCENTRATION OF METAL CONTAMINANTS
FOR CHARACTERISTIC OF E.P. TOXICITY

Arsenic	5.0 mg/l
Barium	100.0 mg/l
Cadmium	1.0 mg/l
Chromium	5.0 mg/l
Lead	5.0 mg/l
Mercury	0.2 mg/l
Selenium	1.0 mg/l
Silver	5.0 mg/l

The extraction procedure itself is intended to simulate landfill leaching under natural conditions. The analytical method for determining the concentrations of these metals- extraction procedure toxicity testing - is prescribed in the regulations. Other characteristics such as ignitability, corrosivity and reactivity do not apply to the solid material on site.

3.2 ANALYTICAL RESULTS

Final laboratory results for all samples analyzed can be fouind in Attachment 3. A summary of positive analytical results can be found in Tables 1 through 4.

3.2.1 CONTAINERIZED SOLID WASTE ANALYSES

Due to the large quantities of containerized solid waste material on site, a major portion of the analytical effort was directed towards the characterization of these materials.

Forty-six samples were analyzed for the eight R.C.R.A. metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Although concentration for these metals varied; barium, lead and chromium were consistently higher than the other metals tested.

Due to the high E.P. Toxicity threshold set for barium, it was dropped from further consideration. An additional 30 samples were analyzed for lead and chromium to provide a 50% testing of all waste sampled. Eight of the samples demonostrating metal concentrations ranging from low to high were analyzed for E.P. toxicity. None of the containerized wastes sampled exceeded the E.P. toxic threshold concentrations set by R.C.R.A.

3.2.2 PILE WASTE ANALYSES

Waste piles from areas B and C were tested for prominent R.C.R.A. metals as previously described for the containerized waste. The lead concentrations in these samples were elevated, while chromium concentrations were lower. The E.P. toxicity analyses supported previous findings by meeting threshold concentrations for E.P. toxicity. However, one sample, C-7, had an elevated E.P. Toxicity concentration for lead of 2.8 mg/l. Although this value is 56% of the threshold concentration for lead, it would support further E.P.toxicity testing on a lot by lot basis during actual site clean-up.

3.2.3 P.C.B. ANALYSES

The areas around three transformers were checked for P.C.B. contamination. The two transformers located in Area A (Sample 53a and Sample 58) showed no signs of contamination. The transformer stored in Area C (Sample C-21) displayed slight oil leakage to the soil, resulting in a positive P.C.B. of 21.9 ppm. From oils, one water sample and one oil sample were also checked for P.C.B. Sample A-64, the oil recovery sump along the west side of Area A, tested clean for P.C.B., while Sample D-99, collected from approximately 30 open-head, 30 gallon drums, contained P.C.B. at a concentration of 530 ppm.

3.2.4 VOLATILE ORGANIC ANALYSES

The majority of the 26 volatile organic samples analyzed tested clean (<10 ppb). The exceptions were Sample A-55, a small in-ground sump at the northwest corner of the East Building, which had low levels of chlorinated compounds. Sample A-56, water collected in an underground pit, also had low levels of chlorinated compounds. Sample C-12, collected from soils receiving drainage from a drum storage area, showed traces of tetrachloroethane. Overall, the surface soil and water samples collected across the site indicated very little contamination by volatile organics.

3.2.5 PRIORITY POLLUTANT ANALYSES

The four samples collected for priority pollutant organics tested clean. Three of the four samples tested positive for BIS (2-Ethylhexyl) Phthalate, a common plasticizer often found in environmental samples and usually attributed to cross contamination from sampling equipment or laboratory preparation of samples.

The priority pollutant analysis confirmed the presence of metals previously identified in the processed solid waste. In addition to the R.C.R.A. metals, the priority analyses indicated high levels of copper, nickel and zinc. Although these metals are not used to characterize waste as hazardous they may be important, in determining the final criteria for site decontamination. All cyanide tested clean (<0.25 mg/kg). Total Phenol results were all positive, but in all cases below 0.1 mg/kg.

3.2.6 RADIOCHEMICAL ANALYSES

Three random grab samples were collected to estimate the radioactive potential of the waste material. All samples were analyzed for gross alpha, with results of 64, 114, and 251 Ci/g. The analytical procedure for gross alpha is qualitative and was used in determining health and safety protocol.

3.2.7 OUTFALL ANALYSES

Two sediment samples were collected below the outfalls and anlyzed for semivolatiles, nickel, chromium and lead. The analysis of samples collected from the east and west outfa~~lls~~ showed high lead concentrations of 58 ppm and 56 ppm, respectively.

ppb according to lab sheet
[signature]
1-26-89

4.0 COST ESTIMATES

ESTIMATES FOR SOLIDS, LIQUIDS AND ADDITIONAL REMEDIAL

4.1 SOLIDS

Estimated cost for staging, transporting and disposal of solid material identified on site.

Area "A"	1,413 tons	(drums,crates and piles)
Area "B"	487 tons	(piles)
Area "B"	9,000 tons	(filled-in area)
Area "C"	493 tons	(drums and crates)
Area "C"	3,000 tons	(filled-in area)
Area "D"	2,382 tons	(drums,crates and piles)
Grand Total	16,775 tons	

SCENARIO - A

Based on preliminary laboratory E.P. Toxicity results, it would appear that the solid waste material can be disposed at an appropriate industrial landfill as non-hazardous waste. However, final characterization of all waste before disposal will need to be performed on a lot by lot basis, as non-hazardous material cost can range from $115/ton to $200/ton.

Estimated Cost $1,929,125 to $3,355,000

SCENARIO - B

Based on final solid waste characterization, 30% of solid waste is found to be hazardous while 70% is non-hazardous. Under this scenario hazardous waste would need to be disposed at a cost that can range from $225/ton to $260/ton.

Estimated Cost $2,482,700 to $3,656,950

SCENARIO - C

Filled areas are not removed based on approval of local and state agencies, and all remaining solid waste is non-hazardous.

Estimated Cost $664,125 to $1,155,000

4.2 LIQUIDS

Estimated cost for stagin, transporting and disposal of liquid materials in tanks (Table 5).

The cost estimate is based on inventory of tanks prepared by American Environment Technologies. The basic assumption is that the liquids in the tank are acid or caustic solution with a concentration of 10% by weight and a metal concentration of 5 g/l. Cost does not include disposal of anhydrous ammonia in tank 1302.

Total cost based on transportation/disposal of
311,130 gallons of concentrate liquid material $218,950
Includes transportation/disposal of approximately
40,000 gallons of rinse water.

4.3 ADDITIONAL REMEDIATION COSTS

In discovering additional remediation needs throughout the project, the following addresses the estimated costs associated with each remedial task. Due to the nature of each task, and the incomplete information available in some cases, we have made assumptions as a basis for the estimates. These assumptions may or may not be correct. Variations from these assumptions will affect the estimates.

4.3.1 LAB PACKS

The laboratory area at the Li Tungsten site has been divided into five areas and three sub-areas which contain laboratory chemicals and bulk chemicals (55 gallon drums). The estimated cost is based on labor, material and laboratory testing required to prepare material for shipment, and/or storage in a safe area. The estimated cost does not include the chemical storage area in the Dice building and does not include the removal of gas bottles located in the laboratory. Two alternatives are presented for RTP's consideration:

a) Ship Ready Lab Packs
Labor and materials $49,185

b) Lab Packs Not Ship Ready
Labor and materials $32,000

4.3.2 OVERPACKS

Existing 55-gallon drums containing liquid product and/or waste will be overpacked. Cost estimate includes labor, materials and laboratory testing, but not disposal cost, and is based on a minimum of fifty overpacks. Additional overpacks will be charged at $145/drum. (The expected total quantity is 100.)

Cost Estimate $8,137.50

4.3.3 REMOVAL OF CONTAMINATED WATER

The Dice building and the East building both contain flooded floor areas. Based on the size of the flooded areas and the depth of the water, it was estimated that approximately 19,000 gallons of contaminated water will need to be collected by vacuum truck. Cost estimates include vacuum truck, extension hoses, demurrage, laboratory testing and disposal cost. Disposal of water in excess of the 19,000 gallons will be charged at $0.33/gal.

Cost Estimate $10,175.00

4.3.4 CAPPING OF LAGOONS

Two alternatives are presented for RTP's consideration.

(a) Alternative #1

Cover two small mud ponds and one large lined lagoon with liner (20 mil pvc Ultratech-uv stabilized liner). The life expectancy of this liner is one to two years. Areas demonstrating vegetation would be treated with approved herbicide and prepared for liner installation. If needed, 1/4" plywood could be used to insure that the vegetation does not break through liner. Cost estimates are based on material and labor.

With Plywood	$60,783
Without Plywood	$51,783

(b) Alternative #2

This alternative is preferred since it will initiate remediation of the area. The alternative would require moving the soil from the two small sand ponds to the large pond. Soil removal would be terminated based on laboratory results indicating that the soil is no longer contaminated with heavy metals. Once all material is transferred to the large lagoon, it would be covered with the liner. The soil cover is expected to limit any extensive growth of vegetation, which could perforate the liner. Cost estimate includes labor, earth moving equipment and materials.

Cost Estimate $46,777.00

4.3.5 GAS CYLINDER DISPOSAL

In quoting the removal of 22 gas cylinders, the following assumptions were made. The type of gas is either sulfur dioxide, chlorine, anhydrous ammonia, or hydrogen sulfide. The size of the units are 12 standard units, 10 1/2 standard size. The cylinders are not leaking at the time of packaging and are not severely corroded. Price includes labor, transportation, and disposal for 22 cylinders as described:

<u>Cost Estimate</u> <u>$18,654.00</u>

4.3.6 EMERGENCY TANK LIQUID REMOVAL

Another contractor determined that 129,550 gallons of concentrate, and 25,000 gallons of rinse water need to be disposed of immediately. The quotation does <u>not</u> include any removal, transportation or disposal of anhydrous ammonia. The basic assumption is that liquids present are acidic or caustic solutions with a concentration of 10% by weight with a metal concentration of 5 g/l. This does not apply to the following tanks: underground Tank A, underground Tank B, Tank 35, and Tank 36. All oils must be tested for P.C.B. P.C.B. concentrations cannot be higher than 25 ppm.

<u>Task Cost</u>

Transportation/Disposal

129,550 gallons of concentrate <u>$84,490.00</u>

25,000 gallons of rinse water

Costs have been developed individually. Implementation of all remedial actions may reduce some of the labor cost. Cost estimates are good for forty-five days commencing April 21, 1988. Payments will be due net 15 days and one-third of total cost will be required upon job start-up date.

103939

ANALYTICAL RESULTS

FOR

RADIOCHEMISTRY

ENVIROPACT

Enviropact Northeast, Inc.
540 Palmer Road, 2nd Floor
Yonkers, N.Y. 10701

Attn: John Tostanoski

April 1, 1988
Report T-6187
LAB ID #84271
E84060
Page 1 of 1

Samples Received: 3/23/88
Sample Designation: Analysis as Noted
Collected By: Your Rep.

REPORT OF ANALYSIS	LT-RAD 1	LT-RAD 2	LT-RAD 3	UNITS
Gross Alpha	64	114	251	nCi/g

Analyses made in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully submitted,

Michael T. Osinski

Michael T. Osinski
Laboratory Manager

ENVIROPACT SERVICES INC
TAMPA DIVISION
[illegible] AVENUE NORTH
CLEARWATER FL [illegible] 4835
[illegible]

103941

TABLES

Footnotes for Tables 1-4:

1. Letters in parenthesis under the ANALYTICAL RESULTS column indicate the approximate concentrations at which the substance was found:

   (a) less than 100 ppm
   (b) greater than 100 ppm and less than 499 ppm
   (c) greater than 499 ppm and less than 1000 ppm
   (d) greater than 1000 ppm

2. Volume estimates are based upon surveyed dimensions or rough volume approximations.

TABLE 2

AREA "D"

TOTAL QUANTITY OF SOLID MATERIAL AND ANALYTICAL RESULTS

AREAS	ESTIMATED CUBIC YARDS	ESTIMATED TONS	ANALYTICAL RESULTS
D-1	3.72	5.6	Ba(c),Cr(b),Pb(b)Cd(a)
D-2,3&4	2.16	3.2	
D-5	9.97	14.9	Ba(d),Cd(a),Cr(b),Pb(b)
D-6	28.05	42.1	
D-7	12.94	19.4	Cr(a),Pb(d),Ba(a)
D-8	16.85	25.3	Ba(c)Cr(b),Pb(b),Cd(a)
D-9	3.23	4.8	
D-10	5.23	7.8	Ba(b),Cd(a),Cr(d),Pb(b)
D-11	2.7	4.0	
D-12*	17.64	26.5	Pb(b),Ag(c)
D-13	19.11	28.7	
D-14(3)*	24.97	37.5	Ba(b),Cd(a),Cr(d),Pb(d)
D-15	10.46	15.7	Ba(a),Cd(a),Cr(b),Pb(b)
D-16	13.20	19.8	
D-17	4.52	6.8	
D-18	6.68	10.0	
D-19	2.65	4.0	pH 5.0 Cd(a)
D-20	5.39	8.1	
D-21	8.89	13.3	
D-22	14.55	21.8	Ag(b),Ba(a),Cr(a),Cd(a),Pb(b)
D-23	3.97	5.9	
D-24	9.16	13.7	Cr(a),Pb(b),Ag(a)
D-25	0.54	0.8	
D-26	5.78	8.7	
D-27	1.03	1.5	
D-28	5.66	8.5	
D-29	6.02	9.0	
D-30	5.78	8.7	
D-31	10.65	16.0	Cr(b),Pb(b)
D-32	7.37	11.0	
D-33			
D-34,35	0.34	0.5	Ba(a),Cd(a),Cr(b),Pb(b)
D-36	7.47	11.2	
D-37	16.03	24.0	Cr(b),Pb(b)
D-38	0.59	0.9	
D-39	16.27	24.4	
D-40	30.11	45.2	

(3) Pile measuring approximately 15' x 15' x 3'

TABLE 2 (continued)

AREA "D" (CONTINUED)

AREAS	ESTIMATED CUBIC YARDS	ESTIMATED TONS	ANALYTICAL RESULTS
D-41	23.96	35.9	
D-42	48.02	72.03	Ba(b),Cd(a),Cr(b),Pb(c)
D-43	22.75	34.13	Pb(a)
D-44	35.18	52.8	Cr(a),Pb(b)
D-45	19.67	29.5	
D-46	23.22	34.8	
D-47	4.8	7.2	
D-48	To be removed by Li Tungsten per Bob		
D-49	" " " " " "		
D-50	8.42	12.6	
D-51*	7.1	10.7	Ba(b),Cd(a),Cr(b),Pb(d)
D-52	30.35	45.5	Ba(b),Cd(a),Cr(b),Pb(a)
D-53	23.72	35.6	As(a)
D-54	7.64	11.5	
D-55	29.52	44.3	Ba(a),Pb(a)
D-56	16.81	25.2	Ba(a)
D-57	6.19	9.3	
D-58	5.82	8.7	
D-59	13.06	19.6	Cr(a),Pb(a)
D-60	11.76	17.6	
D-61	23.44	35.2	
D-62	14.11	21.2	pH 6.7 Pb(a)
D-63	35.28	52.9	Cr(b),
D-64	16.22	24.3	Cr(a), Pb(a)
D-65	28.98	43.5	
D-66	Will be removed		Cr(a)
D-67	7.69	11.5	
D-68	21.13	31.7	
D-69	8.0	12.0	
D-70	2.32	3.5	Cr(a)
D-71	46.53	69.8	Ba(a)
D-72	Carbon Black will be removed		
D-73	20.0	30.0	
D-74	5.12	7.7	
D-75	2.94	4.4	
D-76	14.55	21.8	
D-77	6.19	9.3	
D-78	17.19	25.8	Cr(a),Pb(b)
D-79*	14.38	21.6	Cd(b),Pb(b)
D-80	24.5	36.7	Cr(a),Pb(a)

TABLE 2 (continued)

AREA "D" (CONTINUED)

AREAS	ESTIMATED CUBIC YARDS	ESTIMATED TONS	ANALYTICAL RESULTS
D-81	71.21	106.8	
D-82	16.71	25.1	
D-83	Carbon Black will be removed		Ag(a)
D-84	30.62	45.9	Cr(a),Pb(b)
D-85	Misc. boxes with equipment will be removed		
D-86	40.0	60.0	
D-87	18.73	28.1	
D-88	18.32	27.5	Ag(a),Ba(b),Cd(a),Cr(d),Pb(b)
D-89	9.7	14.5	Pb(a)
D-90	36.16	54.2	Cr(a),Pb(a)
D-91	28.73	43.1	Cd(b),Pb(b),Cr(a)
D-92	21.17	31.7	Cr(a),Pb(a)
D-93(Rep.)	35.28	52.9	Cr(a),Pb(a)
D-94	33.98	50.9	Cr(a),Pb(a)
D-95	5.12	7.7	Cr(a)
D-96	28.31	42.5	
D-97	6.74	10.1	
D-98	11.23	16.8	
D-99	Drums contain oils. Need to be repacked and disposed		
D-100	8.2	12.3	Pb(a)
D-101	3.53	5.3	Cd(a)
D-102	Sodium sulfide will be removed by owner		
D-103	15.09	22.6	
D-104	25.87	38.8	Cr(a),Pb(c)
D-105	29.05	43.6	Cr(a),Pb(d)
D-106	18.05	27.1	Pb(a)
D-107	12.45	18.7	
D-108	3.69	5.5	
D-109	22.0	33.0	Cr(a),Pb(d)
D-110	10.55	15.8	Pb(a),
D-111	21.82	32.7	Cr(a)
D-112	14.82	22.2	Ag(b),Ba(c),Cd(a),Cr(b),Pb(d)
D-113	3.23	4.85	Pb(c),Cr(a)

TABLE 3

AREA "B"

TOTAL QUANITY OF SOLID MATERIALS AND ANALYTICAL RESULTS

AREAS	CUBIC YARDS	TONS	ANALYTICAL RESULTS
Landfill	6000.00	9000.0	
B-1			Cr(a),Pb(c)
B-2			Cr(a),Pb(a)
B-3	165.0		Pb(a),Pr(a)
B-4			Pb(c),Cr(a)
B-5			Pb(a),Cr(b)
B-6	80.0		Pb(b),Cr(a)
B-7	80.0		Pb(c),Cr(a)
B-9			Pb(a),Cr(a)
B-10			Cr(a),Pb(b)

TABLE 4

AREA "C"

TOTAL QUANTITY OF SOLID MATERIAL AND ANALYTICAL RESULTS

AREAS	ESTIMATED CUBIC YARDS	ESTIMATED TONS	ANALYTICAL RESULTS
C-15	39.85	59.8	Cr(a),Pb(b)
C-16	238.50	357.8	Cr(a),Pb(a)
C-20	50.69	76.0	Pb(a),Cr(a)
Land Fill Area	2000.00	3000.0	
C-2			Cr(a),Pb(b)
C-3			CR(a),Pb(b)
C-4			Cr(a),Pb(a)
C-6			Pb(c)
C-7			Pb(a),Cr(a)
C-8			P(b),Cr(a)
C-9			Pb(b),Cr(a)
C-11			Pb(a),Cr(a)
C-12			Pb(a),Cr(a)
C-13			Pb(a),Cr(a)
C-14			Pb(c),Cr(a)
C-15			Cr(a),Pb(b)
C-16			Pb(a),Cr(a)
C-17		Ag<.5	Pb(b),Cr(a)
C-18			Pr(a),Pb(a)
C-19			Pb(d),Cr(a)
C-20			Cr(a),Pb(a)
C-22		(CN <1)	Pb(d),Cr(a)

TABLE 5

TANK QUANTITIES AND CONTENTS

CONTENTS	TANK #'S	GALLONS
NH4WO4	L9-E	unknown
APT Mother Liquid	L-6, L-5	15,000
ACR Leachate Sol.	L-13A, L-13B, 246	27,000
Water	L550, L550-A, 1332, 244	19,500
Spent Hcl. Acid	233, 231, 232, 1213-1. 1213-2, 1334	48,250 min
Aqua NH3	235, 1302	3,700 est
Water $ Sheelite	1333	5,500 est
FM Residue	245	15,000
NH3 Solution	1306, 1307, 1308	unknown
ACR Residue	1336	4,500
PD Residue	248	2,500
PD Leachate Sol.	249	23,000
NaOh Solution	242, 35	3,100 est
Stathetic Sheelite	262, 263, 264, 265, 266	280 min
Tungsten Acid	285	unknown
PD Solution & Residue	287, 56, 58	13,000
CaC12	36	2,000
Cobalt Chloride	M-4	1,800
Sodium Tungstate	M-11, K-1, K-2, K-3, K-4, K-6	46,000
NF Residue	K-5, K-7	6,500
Cobalt Sulfate	C-3, C-4, C-5, C-7, C-10, C-11, C-12, C-13	25,200
Water & Lime Mixer	237	8,500

TANK QUANTITIES AND CONTENTS continued

Miscellaneous Items

Unknown Solid	L611, L-568	3,000
Sol. & precipitation from neutraliz.	1328	dirt..8,000
Unknown	1340	2,200
Residue & Leach.	M-1	500
Unknown	M-2	1,100
Unknown	M-5	1,800
Unknown	K-9	7,000
Unknown	W-2	600
Unknown	W-3	12,000
Unknown	832	2,000
Unknown	C-6	700
Unknown	C-14	3,000

Current Quantities Unknown in the Following

1330 (Lime Silo), L-8, L-9A, L-9B, L-9C, L-11, L-9R2, 32, 33, W-1, W-4, 1*, 2*, 3*, 4*, 5*, 6*, 16*, 18*, 20, 21, 24, 25, 26, 78*, C, D, the Water Reservoir and the Oil Change Pit.

Tanks with Unknown Capacities, Contents & Current Capacities.

9, 17*, 19*, 41, 56, 57, 58, 59, 59A, 79*, 80*, 83, 84, 85, 86, 89A, 120, 121, 255, 268, 269, 270, 274, 286, 1342, 1343, 616, 620, 667*, 1303, 1337, 1338, 1339, P-1, A, B, L-101* & K-8.

* = Unable to open.

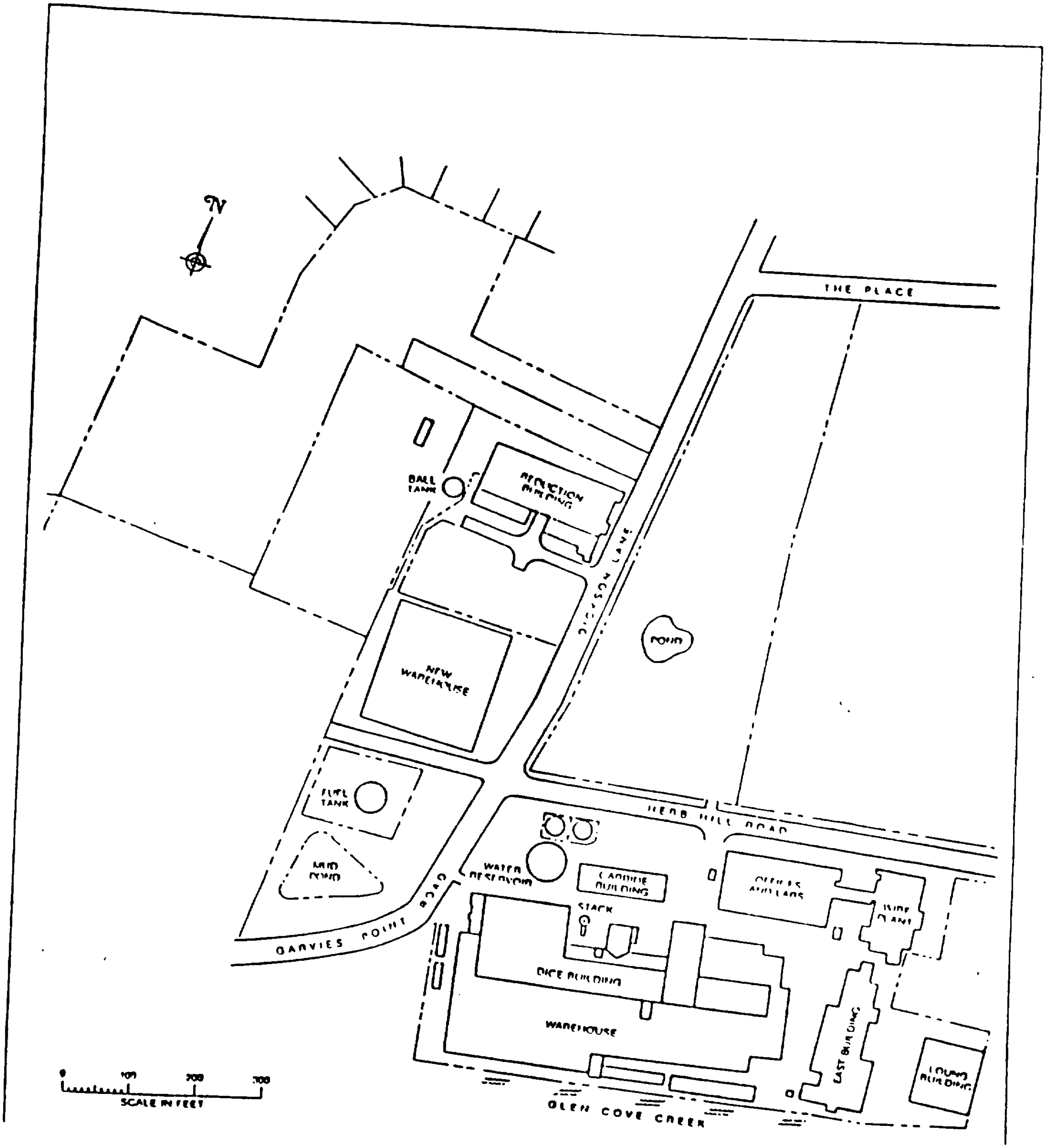
TABLE 6

QUANTITIES & LOCATIONS OF DRUMS CONTAINING LIQUIDS

AREA	QUANTITY
A-50	4 DRUMS
A-56	7 DRUMS
A-57	6 DRUMS
A-8	35 DRUMS
A-10	8 DRUMS
A-14	2 DRUMS
A-24	2 DRUMS

INSIDE THE DICE BUILDING

AREA	QUANTITY
111	4 DRUMS
91	3 DRUMS
40	6 DRUMS
47	2 DRUMS
84	1 DRUM
60	3 DRUMS
55	1 DRUM
54	6 DRUMS
Between 32 & 33	11 DRUMS
99	30 30 GAL. DRUMS



ENVIROPACT

TITLE: SITE MAP

SCALE: N/A

DRAWN BY: RTP

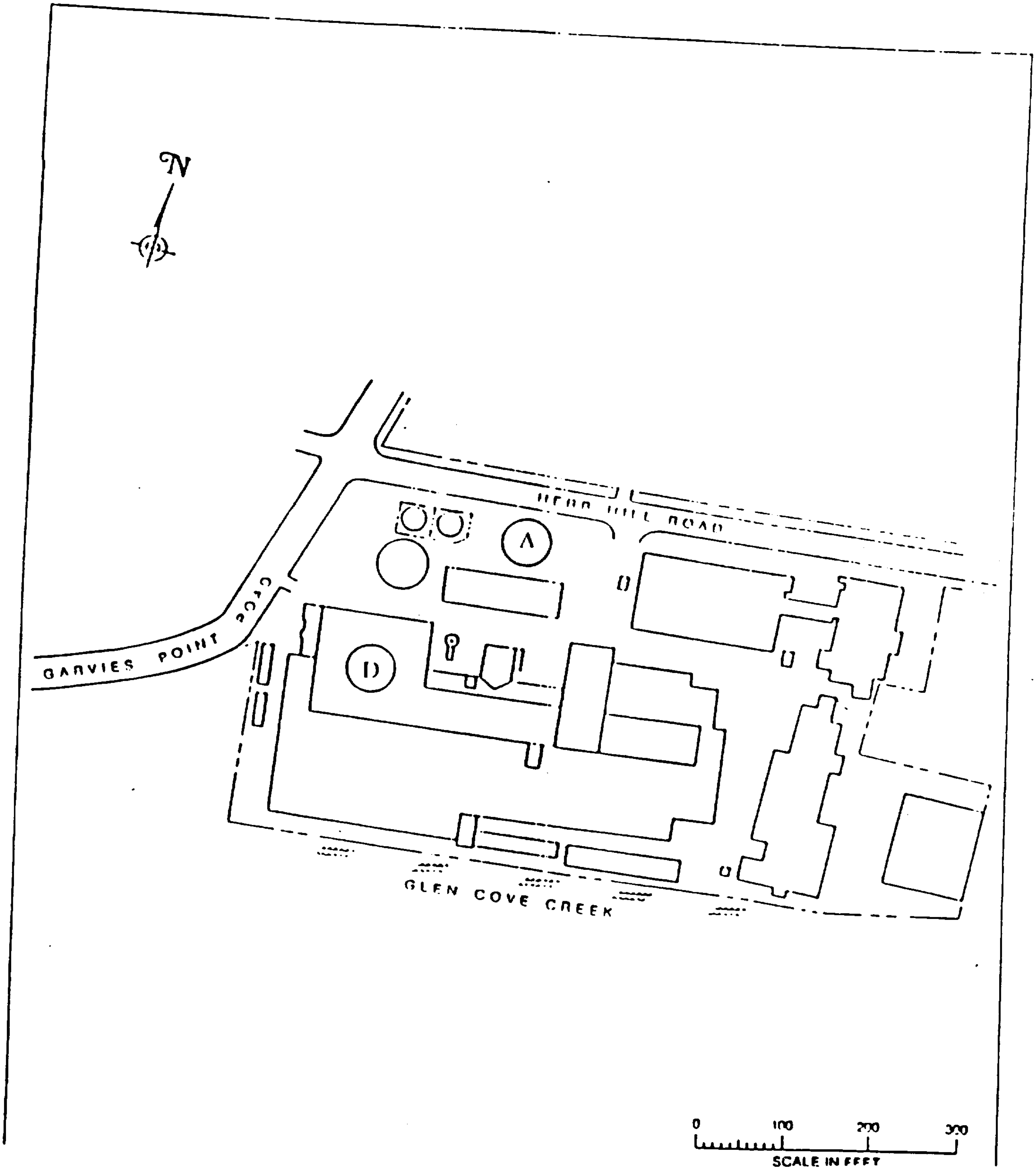
DATE: 4/25/88

PROJECT #4190-01

REVISED: –

DRAWING # 1

103951



ENVIROPACT

TITLE: AREA A & D

SCALE: N/A

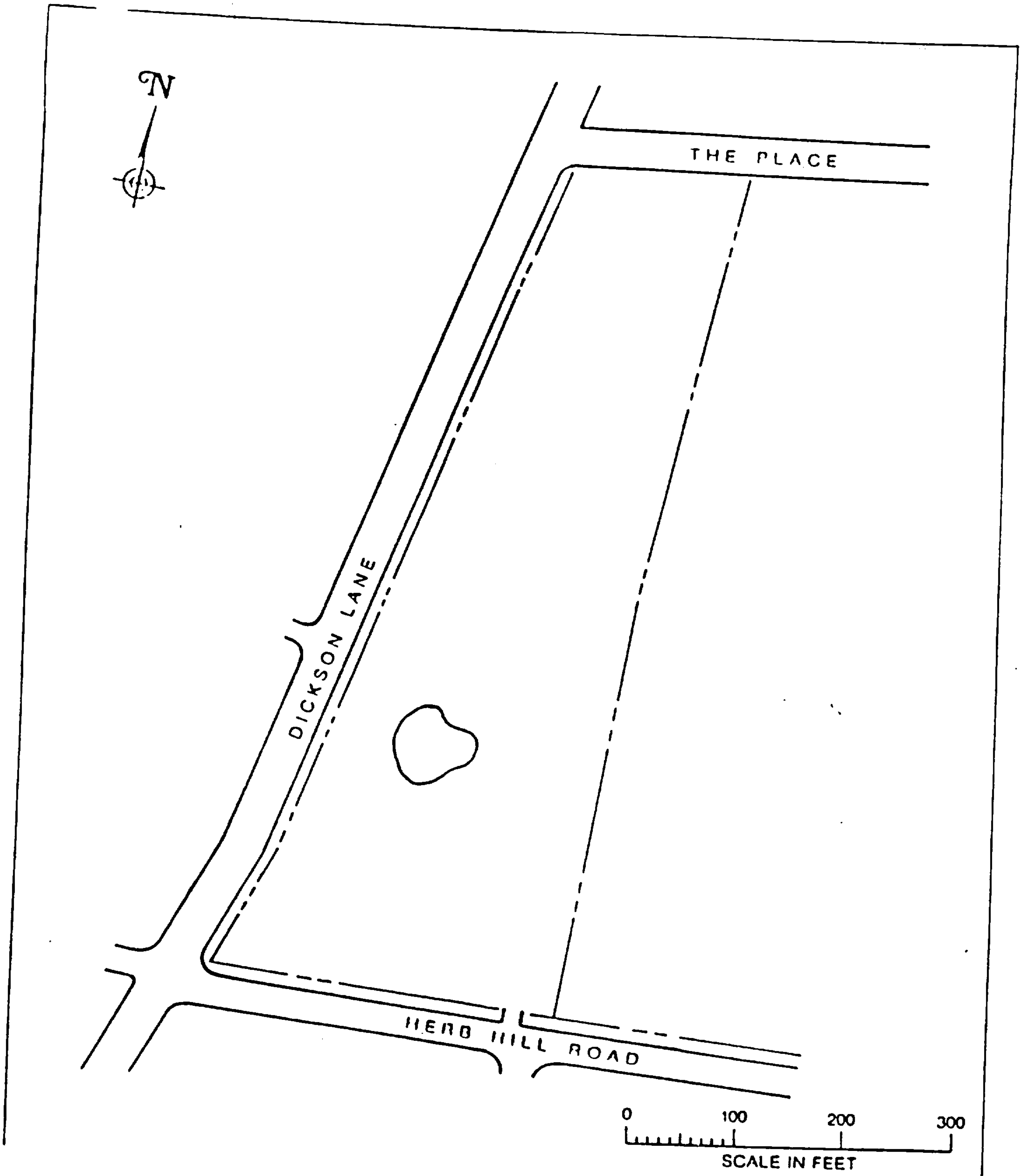
DATE: 4/25/88

REVISED: -

DRAWN BY: RTP

PROJECT 4190-01

DRAWING #2



ENVIROPACT

TITLE: AREA B

SCALE: N/A

DRAWN BY: RTP

DATE: 4/25/88

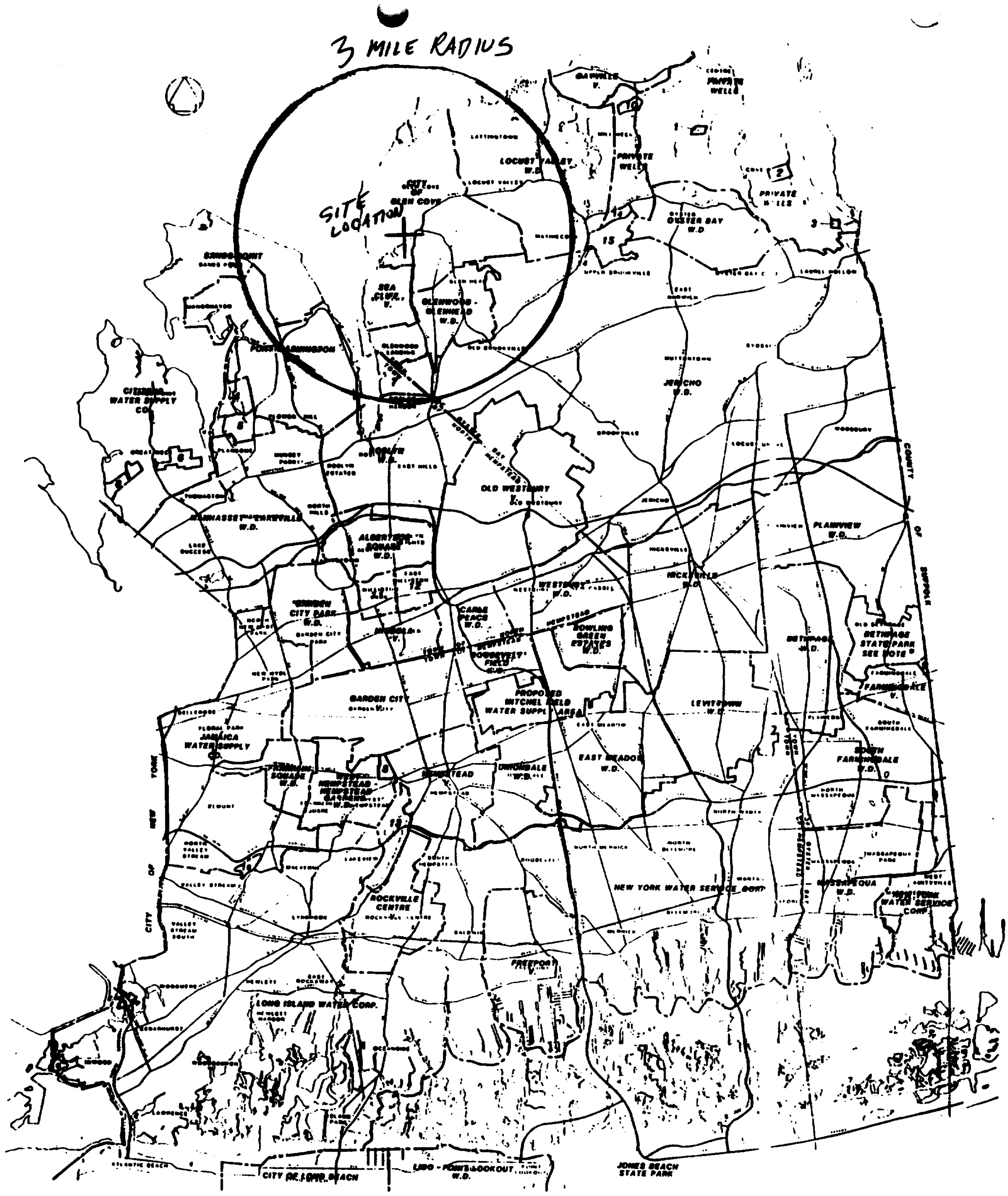
PROJECT 4190-01

REVISED: -

DRAWING # 3

103953

REFERENCE NO. 9



LEGEND

V. - VILLAGE

W.D. - WATER DISTRICT

W.S.D. - WATER SUPPLY DISTRICT

AREA IDENTIFICATION

1. SPLIT ROCK ASSOCIATION
2. BEL VRA ASSOCIATION
3. DEFOREST ASSOCIATION
4. MANHASSET - LAKEVILLE W.D.
5. PLANDOME V.
6. GREAT NECK W.D.
7. GLENWOOD W.D.
8. GARDEN CITY SOUTH W.D.
9. NORTHEAST FARMINGDALE W.S.D.
10. MILL NECK ESTATES
11. WILLISTON PARK V.
12. EAST WILLISTON V.
13. HEMPSTEAD LAKE STATE PARK - SERVICED BY LONG ISLAND WA[illegible] CORP. AND ROCKVILLE CENTRE V.
14. OYSTER BAY W.D.
15. PLANTING FIELDS ARBORETUM - SERVICED BY PRIVATE WELLS
16. VALLEY STREAM STATE PARK - SERVICED BY LONG ISLAND WAT[illegible] AND JAMAICA WATER SUPPLY CO.

*NOTE: BETHPAGE STATE PARK - SERVICED BY BETHPAGE W.D. AND PLAIN[illegible] W.D.

NOTE:
INFORMATION SHOWN ON THIS MAP HAS BEEN OBTAINED FROM THE OFFICE OF THE NASSAU COUNTY DEPARTMENTS OF ASSESSMENT AND HEALTH

0.5" = 6400 FT.

WATER SUPPLY AND WATER DISTRICTS

THE NASSAU COUNTY PLANNING COMMISSION

DATE - OCT 1984

PLATE 8

9

103955

Table 5

WATER DISTRICTS AND WATER SUPPLY

THE FOLLOWING AREA AND POPULATION INFORMATION FOR WATER SERVICES IN NASSSAU COUNTY IS UTILIZED IN CONJUNCTION WITH PLATE 5

	Type of Service	Population: 1980 U.S. Census	Population: NCPC Estimate	Area (Acres)
TOWN OF HEMPSTEAD				
Bethpage***	W.D.		3,100	296
Bowling Green Estates	W.D.		9,700	887
East Meadow	W.D.		42,150	3,580
Franklin Square	W.D.		16,800	1,039
Freeport	V.	38,272		3,508
Garden City	V.	22,927		3,413
Garden City South	W.D.		1,050	87
Hempstead	V.	40,404		2,327
Hicksville***	W.D.		5,400	497
Jamaica Water Supply*	PVT.		73,650	5,166
Levittown	W.D.		41,950	3,112
Lido-Point Lookout	W.D.		4,500	1,476
Long Beach	CITY	34,073		1,590
Long Island Water Corp.	PVT.		238,950	27,054
New York Water Service Corp.	PVT.		126,650	12,496
Mineola*	V.	52		11
Rockville Centre	V.	25,405		2,196
Roosevelt Field	W.D.		100	858
Uniondale	W.D.		23,100	2,005
West Hempstead-Hempstead Gardens	W.D.		23,000	1,556
Mitchel Field Water Supply Area	(PROPOSED)		1,250	1,970
TOWN OF NORTH HEMPSTEAD				
Albertson Square	W.D.		11,650	1,453
Carle Place	W.D.		9,300	987
Citizens Water Supply Co.	PVT.		22,500	3,922
East Williston	V.	2,708		369
Garden City	V.	0		1
Garden City Park	W.D.		19,900	2,022
Glenwood	W.D.		350	282
Great Neck	W.D.		2,450	272
Jamaica Water Supply*	PVT.		18,150	1,140
Manhasset-Lakeville	W.D.		32,600	6,099
Mineola*	V.	20,705		1,186
Old Westbury***	V.	2,175		3,328
Plandome	V.	1,503		315
Port Washington	W.D.		27,150	4,220
Roslyn	W.D.		16,700	3,463
Sands Point	V.	2,742		2,743
Westbury	W.D.		19,750	2,151
Williston Park	V.	8,216		390
TOWN OF OYSTER BAY				
Bayville	V.	7,034		924
Bethpage**	W.D.		24,850	3,557
Farmingdale	V.	7,946		696
Glen Cove	CITY	24,618		4,336
Glenwood-Glenhead	W.D.		6,650	1,878
Hicksville**	W.D.		42,600	4,470
Jericho	W.D.		55,300	24,034
Locust Valley	W.D.		7,050	5,443
Massapequa	W.D.		44,950	4,028
New York Water Service Corp.	PVT.		17,600	2,229
Northeast Farmingdale	W.S.D.		400	59
Old Westbury*	V.	1,102		1,819
Oyster Bay	W.D.		6,300	2,358
Plainview	W.D.		32,700	5,190
Sea Cliff	V.	5,364		752
South Farmingdale	W.D.		43,300	3,817
DeForest Drive	P.W.A.		30	12
Mill Neck Estates	P.W.A.		250	60
SEL VRA	P.W.A.		80	60
Split Rock	P.W.A.		70	20

* Part in Town of North Hempstead
** Part in Town of Hempstead;
*** Part in Town of Oyster Bay
W.D. - Water District
W.S.D. - Water Supply District
V. - Village
PVT. - Private Company
P.W.A. - Private Water Association

Area Sources: Long Island Regional Planning Board, Existing Land Use, 1968; Nassau County Planning Commission planimeter estimates

Population Sources: 1980 U.S. Census and Nassau County Planning Commission estimates based on 1980 U. S. Census

New York State Atlas of Community Water System Sources 1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

FOREWARD

SOURCE LOCATIONS

The county maps in this atlas show the locations of surface water intakes and groundwater sources for community water systems in New York State. A community water system is defined in Part 5 of the New York State Sanitary Code as a public water system which serves at least five service connections used by year round residents or regularly serves at least 25 year round residents. Many different types of water systems are therefore included. Community water systems which purchase 100 percent of their water and have no sources of their own are not shown.

Each county map is accompanied by a list of the county's community water systems, population served, and source names. Systems are separated into MUNICIPAL COMMUNITY (program code 100) and NON-MUNICIPAL COMMUNITY (all other program codes) and listed alphabetically within each. MUNICIPAL COMMUNITY water systems are operated by a city, town, village, county or water authority or the water system may be a water district or privately owned. NON-MUNICIPAL COMMUNITY systems are primarily mobile home parks but also include apartments/condominiums, resident health care facilities, resident institutions, and federal facilities.

EXPLANATION OF SYMBOLS

Suface water intakes are designated on the county maps by a triangle (▲) accompanied by the corresponding water supply number.

Groundwater sources are designated by a dot (•) followed by the supply number. Multiple wells separated by less than 1000′ and supplying the same water system are shown with one dot. Springs and infiltration galleries are shown as groundwater sources unless the local health unit has designated it a surface source. Therefore, springs and infiltration galleries are listed as wells (springs) or wells (infiltration galleries).

If a Community Water System has source(s) located outside the county, these sources are shown in the county list and show in parentheses the system number, county and page number. Conversely, when a county contains source(s) which supply community water systems located outside the county, the name of the system is also shown in that county's list of sources.

ACKNOWLEDGEMENT

Data compiled in this Atlas is based on location of community water system sources from visits, in 1979, to every county health unit in the State by technicians working for the Bureau of Public Water Supply Protection. This data was updated in 1982 through use of the Department of Health's SAFWATER computer inventory and through limited field review. The Bureau of Public Water Supply Protection wishes to acknowledge the following organizations who have made the Atlas possible:

To the United States Environmental Protection Agency for funding this Atlas as a part of the Underground Injection Control Program.

To the Cartography Section of the New York State Department of Transportation for providing the talent, time and effort in performing the necessary cartographic work to produce this Atlas.

To the engineers and technicians of the Bureau of Public Water Supply Protection of the New York State Department of Health for the painstaking work of gathering the basic data and cross-checking it, and for leading this project through to completion.

New York State Atlas of Community Water System Sources 1982

NEW YORK STATE DEPARTMENT OF HEALTH

TABLE OF CONTENTS

LEGEND

BOUNDARIES AND PLACES

- International
- State
- County
- Town
- Indian Reservation
- City
- Village
- Unincorporated Place
- Federal Reservation
- Built-up Area (Over 25,000 population including any contiguous city or village)

CLASSIFICATION OF POPULATED PLACES

100,000 or more	YONKERS
50,000 to 100,000	Levittown
12,500 to 50,000	Poughkeepsie
2,500 to 12,500	Hampton Bays
250 to 2,500	Boiceville
250 or less	Corbett

TRANSPORTATION

Highways — UNDER CONSTRUCTION

- Divided Highways
  - Full Control of Access
  - Partial or No Control of Access
- Undivided Highway
- Interchange — INTERCHANGE NUMBER — FULL — PARTIAL
- Touring Route (State, U.S., Interstate) or State Parkway
- Touring Route Markers State, U.S., Interstate — 17 9 81

Railroads

- Operating Line
- Service Discontinued
- Operator — DELAWARE AND HUDSON
- Owner (If Other than Operator) — (PENN CENTRAL)
- Company Having Trackage Rights — (CONRAIL)

Airports (Open to the Public, Military)

- Runway under 4000'
- Runway over 4000'

Rest Areas

- Food, Gas, Rest Rooms
- Gas, Rest Rooms
- Rest Rooms
- Parking Only

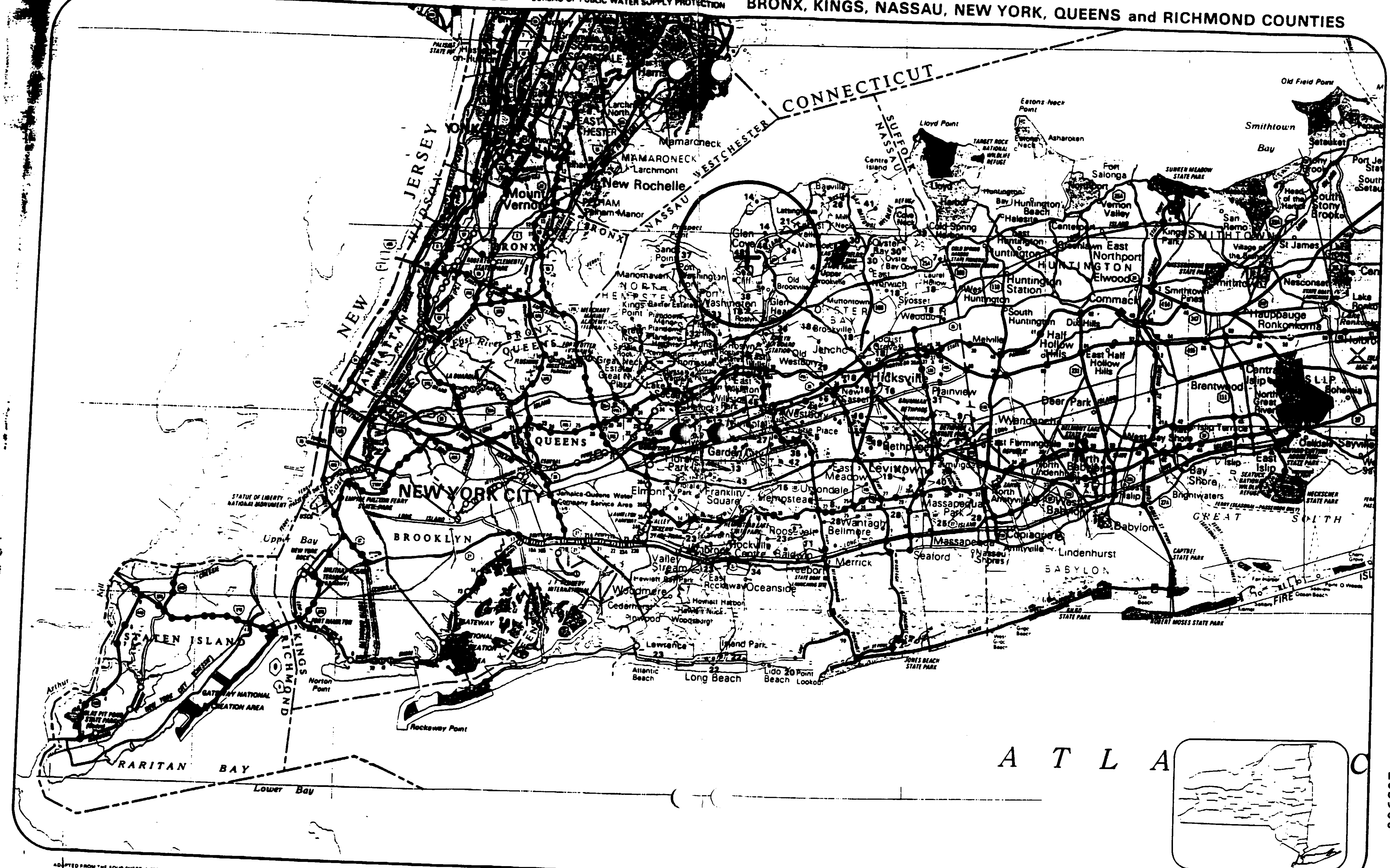
RECREATION FACILITIES

- State or National Recreation Area
- State Campground
- State Boat Launching Site
- State Canal Park
- State Fish Hatchery
- Other State Recreation Site

LOCATION OF COMMUNITY WATER SYSTEM SOURCES-1982

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF PUBLIC WATER SUPPLY PROTECTION

BRONX, KINGS, NASSAU, NEW YORK, QUEENS and RICHMOND COUNTIES



ADAPTED FROM THE FOUR SHEET 1:250,000 SCALE NEW YORK STATE MAP © 1980 BY THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION

1" = 4 MILES

SCALE 1:250,000

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NASSAU COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
Municipal Community			
1	Albertson Water District	13500	Wells
2	Bayville Village	7500	Wells
3	Bethpage Water District	32000	Wells
4	Bowling Green Water District	12000	Wells
5	Carle Place Water District	11000	Wells
6	Citizens Water Supply Company	30000	Wells
7	Deforest Drive Association	25	Wells
8	East Meadow Water District	52000	Wells
9	Farmingdale Village	7946	Wells
10	Franklin Square Water District	20000	Wells
11	Freeport Village	38272	Wells
12	Garden City Park Water District	22596	Wells
13	Garden City Village	22927	Wells
14	Glen Cove City	24618	Wells
15	Hempstead Village	40404	Wells
16	Hicksville Water District	58000	Wells
17	Jamaica Water Supply Company	128448	Wells
18	Jericho Water District	64000	Wells
19	Levittown Water District	50000	Wells
20	Lido-Point Lookout Water District	10000	Wells
21	Locust Valley Water District	8500	Wells
22	Long Beach City	34073	Wells
23	Long Island Water Corporation	258936	Wells
24	Manhasset-Lakeville Water District	44730	Wells
25	Massapequa Water District	52000	Wells
26	Mill Neck Estates Water Supply	240	Wells
27	Mineola Village	20600	Wells
28	New York Water Service	172180	Wells
29	Old Westbury Village	3100	Wells
30	Oyster Bay Water District	10225	Wells
31	Plainview Water District	40000	Wells
32	Plandome Village	2616	Wells
33	Port Washington Water District	35000	Wells
34	Rockville Centre Village	25405	Wells
35	Roosevelt Field Water District	1640	Wells
36	Roslyn Water District	27500	Wells
37	Sands Point Village	3002	Wells
38	Sea Cliff Water Company	17850	Wells
39	Sel-Bra Acres Water Supply	80	Wells
40	South Farmingdale Water District	49900	Wells
41	Split Rock Water Supply	25	Wells
42	Uniondale Water District	25000	Wells
43	West Hempstead-Hempstead Garden Water District	32000	Wells
44	Westbury Water District	20050	Wells
45	Williston Park Village	8216	Wells
Non Municipal Community			
46	Community Hospital at Glen Cove	1350	Wells
47	Planting Fields Arboretum	90	Wells
48	Stuart, Walker, Zimmer Water Supply	41	Wells

NEW YORK CITY WATER SUPPLY

The majority of New York City residents receive their drinking water from the New York City Aqueduct System. Only a portion of the borough of Queens is supplied by a separate ground-water system, the Jamaica Water Supply.

The New York City Aqueduct System consists of the Croton, Delaware, and Catskill branches. It is supplied by reservoirs and lakes in Westchester, Putnam, Ulster, Schoharie, Delaware, and Sullivan Counties. The reservoirs and lakes supplying the respective aqueduct branches are designated in those counties.

CROTON SYSTEM - The Croton supply is the oldest system which has a safe yield of about 240 MGD*. The Croton System embodies 12 reservoirs and 4 controlled lakes, situated in Westchester and Putnam Counties, which impound about 95 billion gallons of water from 375 square miles of the Croton River drainage area. The principal structures in the present Croton System are the New Croton Dam and the New Croton Aqueduct which supplemented the Old Croton Aqueduct now out of service. Croton water is delivered via the New Croton Aqueduct to the Jerome Park Reservoir in the Bronx and then via aqueduct and conduits to the Central Park Reservoir in Manhattan. The delivery capacity of the Aqueduct from the New Croton Reservoir to the Jerome Park Reservoir is 275 MGD.

CATSKILL SYSTEM - The Catskill supply is the second major system which has a safe yield of about 470 MGD. Its principal structures are the Schoharie, Ashokan, Kensico, and Hill View Reservoirs.

The Ashokan Reservoir impounds 128 billion gallons of available storage, at Elevation 590 in the West Basin and at Elevation 587 in the East Basin, from 257 square miles of drainge area in the Catskill Mountains west of Kingston. The Ashokan Reservoir feeds directly into the Catskill Aqueduct.

The Schoharie Reservoir, placed in service in 1924, impounds 19.6 billion gallons of available storage, at Elevation 1130, from 314 square miles of drainage area.

The Catskill Aqueduct is 92 miles long overall, extending 75 miles from the Ashokan Reservoir to the upstream influent chamber of the Kensico Reservoir, with a 2-mile bypass, then continuing 15 miles from the Kensico Reservoir effluent chamber to the Hill View Distributing Reservoir in Yonkers.

The Kensico Reservoir was originally constructed as an equalizing basin on the Catskill Aqueduct. The reservoir, having a safe yield of 5 MGD from its own drainage area, is formed by the Kensico Dam.

DELAWARE SYSTEM - The Delaware supply is the latest system which has a safe yield of about 580 MGD. The supply from the Delaware watershed, which is stored in the Neversink, Pepacton, and Cannonsville Reservoirs, has a safe yield of about 480 MGD. The Rondout Reservoir, serving as a collecting reservoir for these three reservoirs, has a safe yield of about 100 MGD from its own drainage area of 95 square miles which is part of the Hudson watershed. This reservoir impounds 50 billion gallons of available storage at the flow line, Elevation 840.

The Delaware Aqueduct is a pressure tunnel deep in bed rock for its entire length of 85 miles.

JAMAICA WATER SUPPLY - The Jamaica-Queens Water Company serves the Jamaica section of the borough of Queens. This system utilizes 76 wells located in 46 separate well fields. A map depicting the Jamaica-Queens service area is included on Page 77

* Millions of Gallons per Day

REFERENCE NO. 10

MONTHLY FLUCTUATIONS IN THE QUALITY OF GROUND WATER NEAR THE WATER TABLE IN NASSAU AND SUFFOLK COUNTIES, LONG ISLAND, NEW YORK

by Brian G. Katz, Stephen E. Ragone, and Juli B. Lindner

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations 78-41

Prepared in cooperation with the

Nassau County Department of Public Works
Suffolk County Department of Environmental Control
Suffolk County Water Authority

Syosset, New York
1978

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CONVERSION FACTORS AND ABBREVIATIONS

Factors for converting U.S. Customary units to metric units are shown to three or four significant figures. However, in the text the metric equivalents are shown only to the number of significant figures consistent with the values for the English units.

U.S. Customary	Multiply by	Metric
inch (in.)	2.54	centimeters (cm)
foot (ft)	.3048	meter (m)
mile (mi)	1.609	kilometers (km)
gallon (gal)	3.785	liters (L)
gallons per minute (gal/min)	.06309	liters per second (L/s)
million gallons (Mgal)	3.785	million liters (mil L)
million gallons per day (Mgal/d)	.004381	cubic meters per second (m^3/s)
		meters per day (m/d)
		liters per second per meter [(L/s)/m]
pound (lb)	.4536	kilogram (kg)
acre	.405	square hectometer (hm^2)

MONTHLY FLUCTUATIONS IN THE QUALITY OF WATER NEAR THE WATER TABLE IN NASSAU AND SUFFOLK COUNTIES, LONG ISLAND, NEW YORK

By

Brian G. Katz, Stephen E. Ragone,

and Juli B. Lindner

ABSTRACT

Water samples from wells in a sewered and an unsewered suburban area and an unsewered rural area on Long Island, N.Y., were collected and analyzed monthly from August 1975 to July 1976 to determine the concentrations of chloride, sulfate, and nitrate in ground water near the water table. Short-term and seasonal fluctuations in concentrations of these substances were evaluated to determine their relation to nonpoint discharges.

Major factors that may cause concentrations of these substances to fluctuate at any particular site are precipitation, lawn fertilizer, dissolved salts in storm runoff, and effluent from septic tanks and cesspools. Chloride concentrations during the study fluctuated by as little as 2 milligrams per liter (mg/L) at some sites and as much as 300 mg/L at others. Nitrate and sulfate concentrations showed essentially no change at some sites but fluctuated by as much as 8 and 40 mg/L, respectively, at others. Short-term fluctuations in the concentrations of these substances in ground water seem to have no consistent correlation with type of land use (suburban or agricultural) or precipitation but seem to be related to seasonal variations in input from specific nonpoint sources.

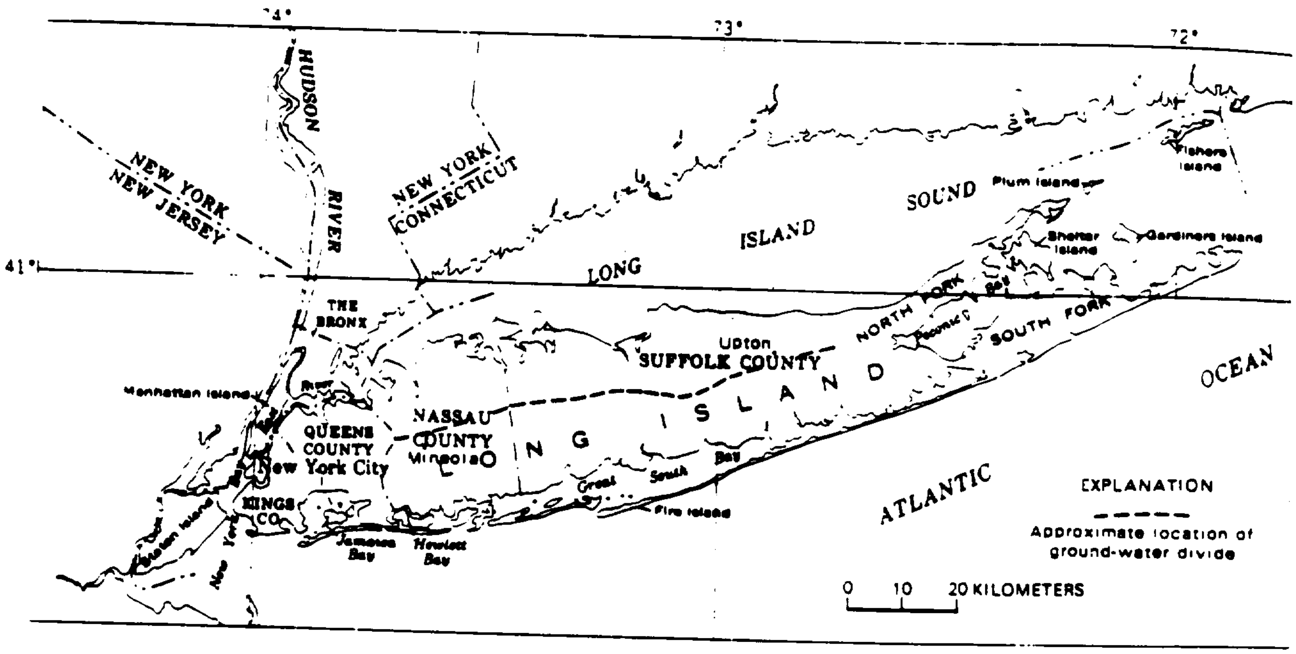

Figure 1.--Location and major geographic features of Long Island, New York.

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INTRODUCTION

Ground water is the sole source of freshwater for more than 2.7 million residents of Nassau and Suffolk Counties, Long Island, New York (fig. 1). Under natural conditions, the ground-water reservoir is recharged only by precipitation. Population growth and urbanization on Long Island have caused a steady increase in the demand for fresh ground water and have affected its quality through the discharge of wastes and other contaminating products to the ground-water reservoir. A significant amount of the changes in water quality are attributed to the increased discharge of dissolved chloride, nitrate, and sulfate to the aquifer from nonpoint sources such as wastewater from cesspools and septic tanks, salts for road deicing, and fertilizers for lawns and agriculture. Precipitation and storm-water runoff are the principal agents in moving these substances through the ground to the water table.

In general, the upper glacial aquifer is the water-table aquifer in most of Long Island. As the uppermost aquifer on the island, it is the most susceptible to contamination.

Purpose and Scope of Study

To date, information on short-term fluctuations in quality of shallow ground water in Nassau and Suffolk Counties is incomplete. To obtain data on short-term fluctuations in water quality in these counties and to correlate them with their probable main controlling factors, the U.S. Geological Survey collected water samples monthly from August 1975 to July 1976 from 30 wells screened in the upper glacial aquifer. The data obtained from these samples are described, summarized, and interpreted in the sections that follow. Air and ground-water temperatures during the sampling period are correlated to determine the effect of seasonal changes in the temperature of precipitation entering the aquifer. Chloride, nitrate, and sulfate were selected for analysis in this report because they are the major inorganic ions in ground water and can be indicative of ground-water contamination.

Previous Studies

Short-term fluctuations and seasonal variations in ground-water quality have recently received an increasing amount of attention in the literature. Pluhowski and Kantrowitz (1964) reported on factors affecting monthly ground-water temperatures over a 2-year period. Pettyjohn (1971, 1975, 1976) reported that nitrate and chloride concentrations in ground water increase substantially after periods of precipitation. Walker (1973, 1973a) reported that nitrate in soil moves downward to shallow aquifers during recharge periods in the late fall and early spring. Toler and Pollock (1974) stated that deicing salt that has accumulated in the unsaturated zone is eventually flushed from the soil to the water table by spring recharge. Schmidt (1972, 1977) described short-term variations and seasonal trends of nitrate and chloride in ground water and discussed factors that possibly control these variations. Piskin (1973) discussed factors that affect seasonal variations of nitrate in ground water.

Method of Study

Ground-water near the water table was monitored at wells along three north-south and two east-west trending lines in a sewered and an unsewered area in Nassau County (fig. 2A) and a rural area in Suffolk County (fig. 2B). These wells range in diameter from 3.2 cm to 15 cm, and the screened interval is generally 0.9 m in the small-diameter wells and 3.0 m in the large-diameter wells. The range in depth to water over the period of sampling, and the average depth of the top of the screens below the water table, are presented in table 1.

Field Sampling

At 24 of the shallow wells in this study (where depth to water was less than 8 m from land surface), a rubber hose was inserted down the casing to below water level. Before water samples were taken by centrifugal pump, three times the volume of water in the well casing was removed to insure a representative ground-water sample. Specific conductance and pH were measured at discharge; dissolved oxygen and temperature were measured in the well.

At the six deeper wells (where depth to water was greater than 8 m from land surface), water samples were taken by submersible pump lowered down the casing to between 3 and 6 m below water level. Again, three times the volume of water in the well casing was cleared before the samples were taken. Specific conductance, pH, and temperature were measured at discharge.

Data Treatment

Water-quality data from the 30 wells sampled on a monthly basis were entered in the U.S. Geological Survey's computer in Reston, Va. The data were retrieved as tables, and analyses in which cation anion balances differed by 20 percent or more were deleted. Chloride, nitrate, and sulfate were selected for analysis because they are the major inorganic ions in ground water.

Analytical accuracy and precision for the principal anionic constituents of water--chloride, nitrate, and sulfate (Cl^-, NO_3^-, and SO_4^{2-})--are presented in table 2 (L. C. Friedman, U.S. Geol. Survey, written commun., 1976). These analyses of standard reference samples were made by the U.S. Geological Survey Laboratory in Albany, N.Y. The standard-deviation values (table 2) were used to determine whether fluctuations above analytical noise were observed in the water-quality data.

Table 1.--Sampling depths at wells monitored during study, August 1975 to July 1976, Nassau and Suffolk Counties, New York

[All depths are in meters]

Well number	Depth to water[1/]	Average depth to top of screen[2/]
	SEWERED AREA, NASSAU COUNTY	
N1129	7.1 - 7.6	5.2
N1143	5.9 - 6.4	14.7
N1164	5.5 - 6.3	5.3
N1165	5.1 - 5.9	6.2
N1167	4.1 - 4.7	2.1
N1168	2.6 - 3.1	4.7
N8235	4.3 - 5.0	10.4
N8598	6.7 - 7.4	5.8
	UNSEWERED AREA, NASSAU COUNTY	
N1160	7.1 - 9.6	0.15
N1176	34.4 - 35.0	24.2
N1183	4.1 - 4.9	4.7
N1194	24.0 - 24.7	4.6
N1201	4.4 - 5.1	3.0
N1250	3.0 - 4.4	5.6
N1251	2.4 - 3.1	2.1
N1252	1.2 - 2.2	4.7
N1253	3.6 - 5.1	3.7
N1254	2.6 - 3.7	5.0
N7397	23.8 - 24.9	4.9
N8669	2.3 - 3.8	7.0
N8789	3.0 - 4.0	4.7
N8888	22.6 - 26.6	7.8
S29778	34.5 - 35.1	13.4
	RURAL AREA, SUFFOLK COUNTY	
S46913	1.2 - 1.5	0.9
S46914	1.8 - 2.3	0.3
S47226	1.0 - 1.5	3.3
S47227	0.9 - 1.6	25.2
S48946	2.1 - 3.1	7.0
S51583	6.1 - 6.9	5.2
S51592	3.4 - 4.0	5.5

1/ In meters below land surface.
2/ In meters below water table.

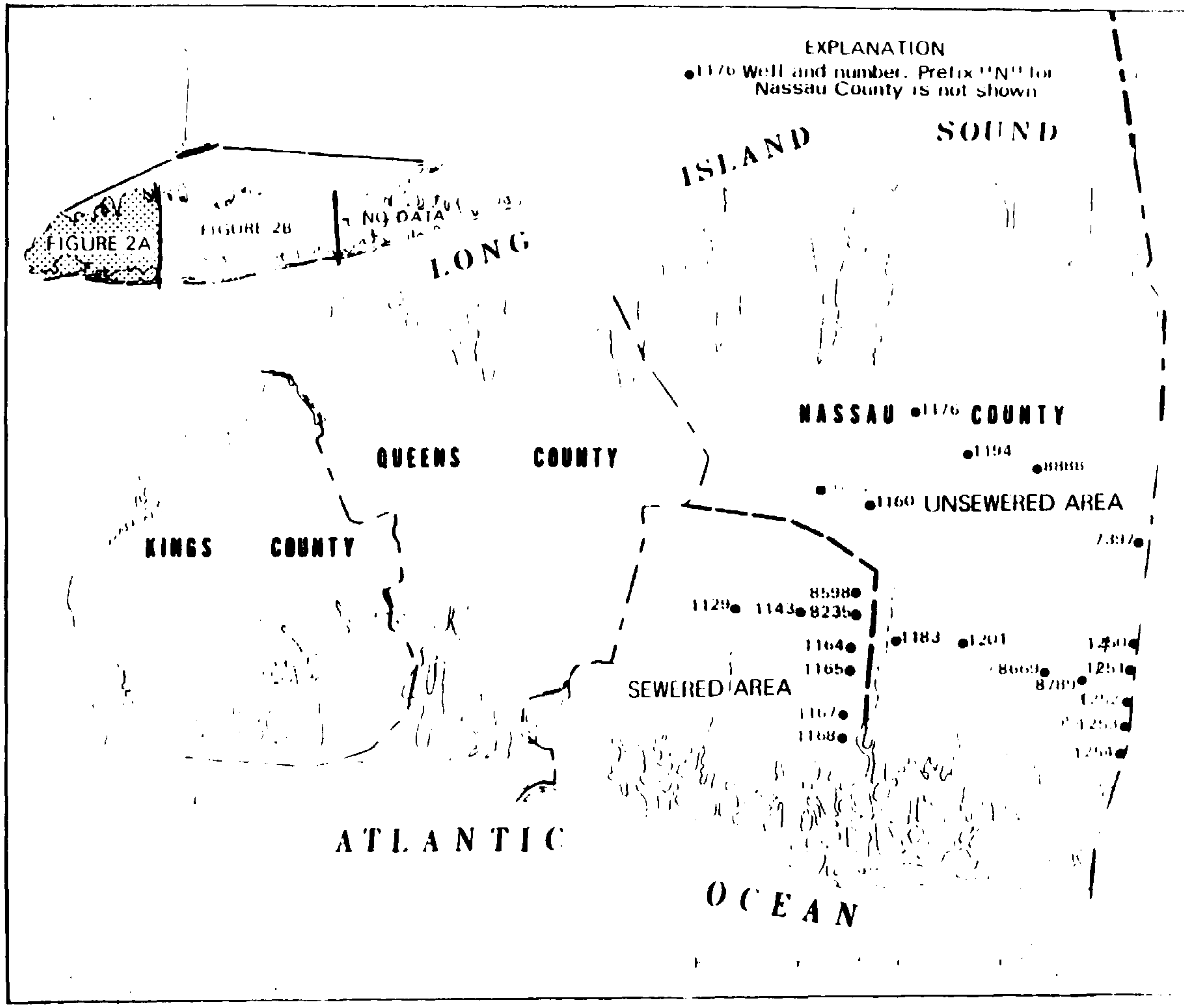

Figure 2A.--Location of wells in sewered and unsewered areas of Nassau County.

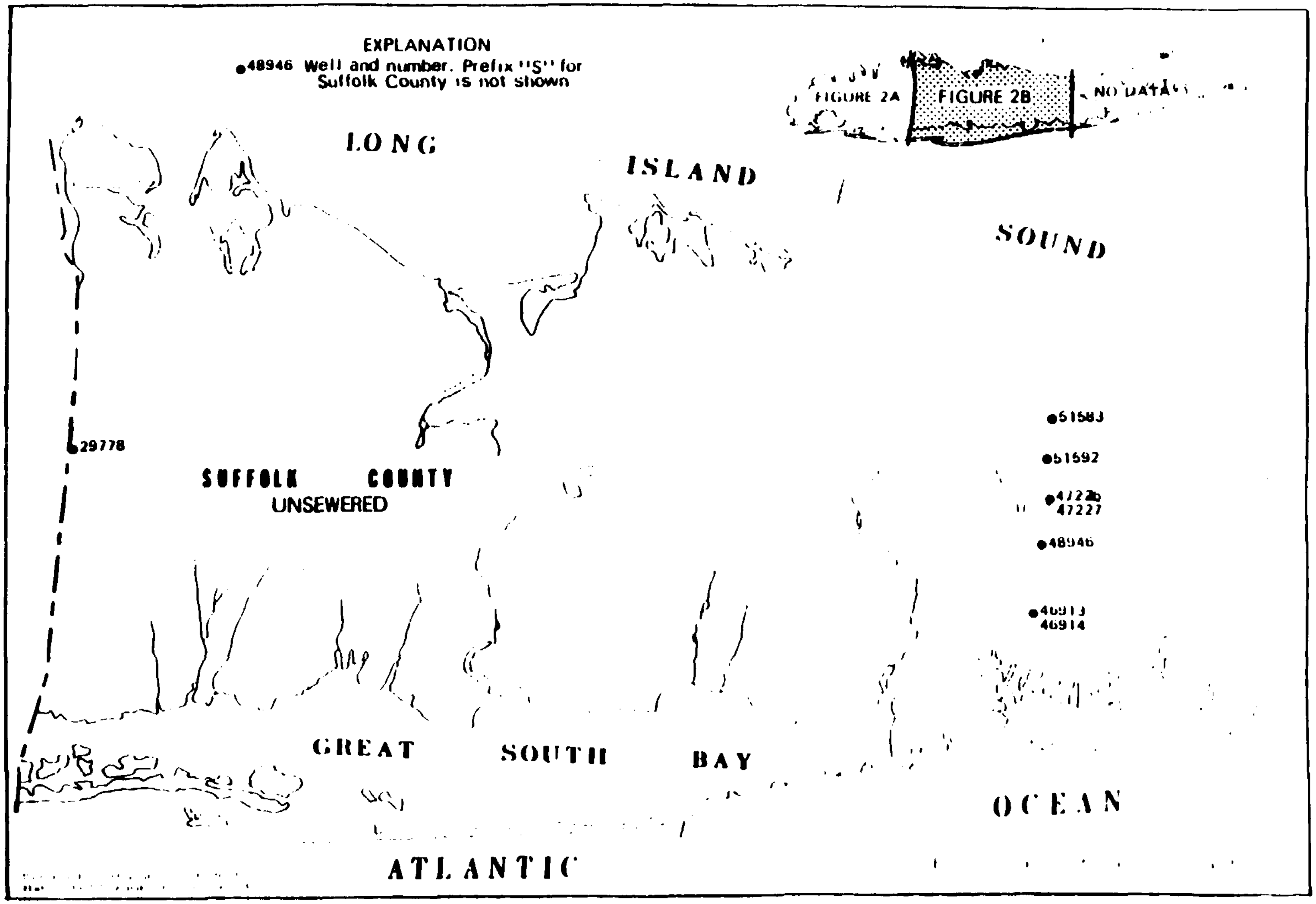

Figure 2B.--Location of wells in a rural area of Suffolk County.

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The wells were selected, in part, according to location. The three types of areas represented include a suburban sewered area and a suburban unsewered area (fig. 2A) and a rural unsewered area (fig. 2B). Nonpoint sources from natural and (or) urbanizing factors, specifically sewage, fertilizer, road salt, and precipitation, were evaluated as to their effect on water quality in each of the three areas.

The sewered part of Nassau County includes Sewage Disposal Districts 1 and 2, which cover an area of about 207 km^2 (fig. 2A). The unsewered section of Nassau County contains Sewage Disposal Districts 3 and 4 and covers an area of about 544 km^2. Domestic wastes in this area are currently (1976) disposed of by shallow septic-tank systems as in the rural area, in eastern Suffolk County, which is unsewered and predominantly agricultural.

Table 2.--Accuracy and precision of analyses for selected ground-water constituents

Constituent	Mean value of standard reference sample (mg/L)	Standard deviation (mg/L)	Percent standard deviation
Chloride (Cl)	1.84	± 0.34	± 18.5
	8.17	.61	7.5
	74.0	1.8	2.4
	124	5	4
	179	3	1.6
Nitrate (NO_2+NO_3-N)	0.097	± 0.013	± 13.4
	.49	.04	8.2
	1.19	.03	2.5
	2.94	.08	2.7
	12.5	.6	4.8
Sulfate (SO_4)	16.3	± 1.2	± 7.4
	22.0	1.8	8.2
	67.8	1.3	1.9
	98.1	1.3	1.3
	105	10	9.5

All analyses performed by U.S. Geological Survey Laboratory in Albany, N.Y.

HYDROGEOLOGY

The hydrogeology of the water-table aquifer is described only generally in this report. More detailed descriptions are given in reports by McClymonds and Franke (1972) and Franke and Cohen (1972). Figure 3 depicts the hydrogeologic system of Long Island and the position of the upper glacial aquifer.

The upper glacial (water-table) aquifer is composed of Pleistocene-age deposits (fig. 3). These consist of (1) till deposits, which are composed of clay, sand, gravel, and boulders and occur in the northern half of the island in moraines; (2) outwash deposits, which consist of quartzose sand and gravel and occur between and south of morainal deposits (fig. 4), and (3) glacio-lacustrine deposits, which consist of silt and clay and are scattered but found mostly in eastern Long Island (McClymonds and Franke, 1972).

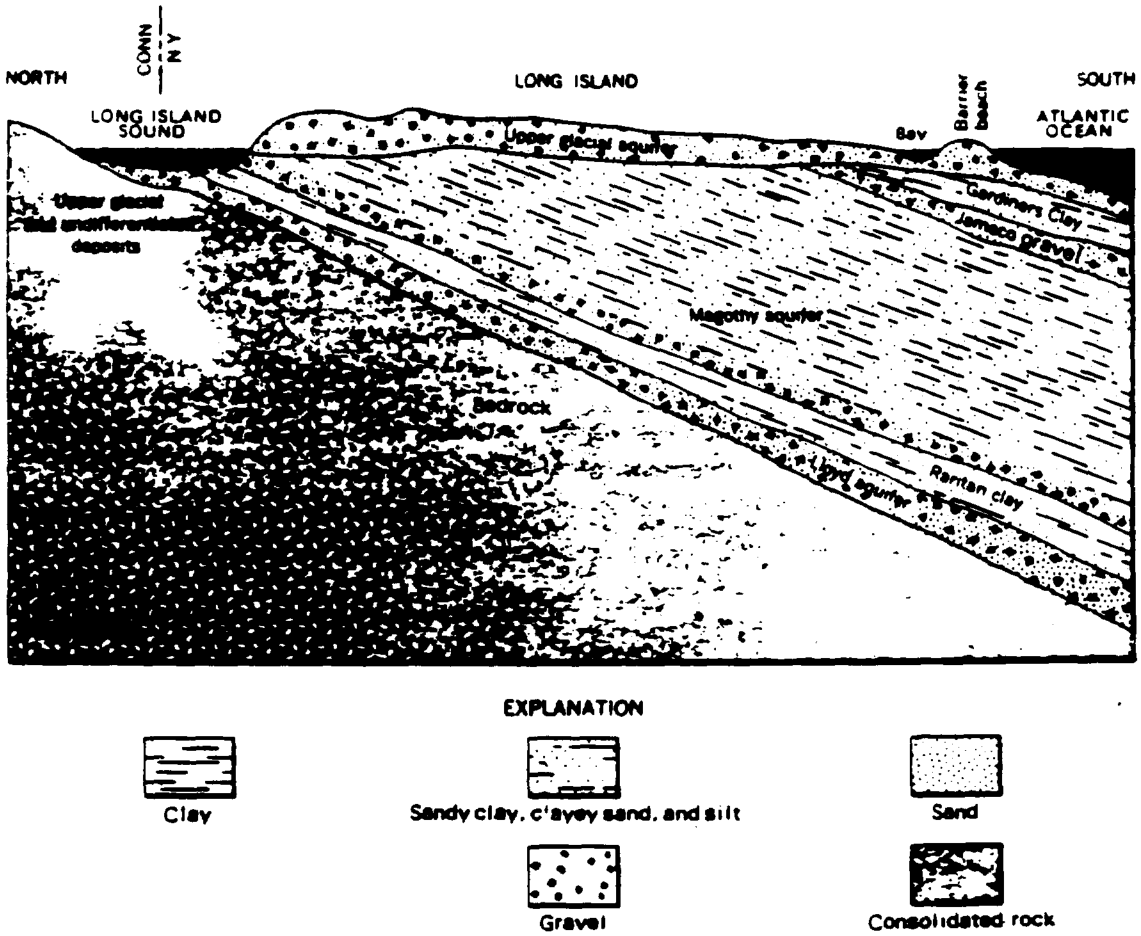

Figure 3.--Schematic representation of aquifers on Long Island (vertical scale greatly exaggerated).

The water-bearing properties of these deposits range from poorly permeable (till) to highly permeable (outwash deposits). Specific capacities of wells tapping these deposits range from very low (almost no yield) in the till to more than 41 (L/s)/m in the outwash (McClymonds and Franke, 1972). Hydraulic conductivities range from 41 to 82 m/d (McClymonds and Franke, 1972). In the northern half of Long Island (fig. 4), depth to water may be as much as 36 m in these poorly permeable deposits, but in the southern half (outwash deposits), depth to water can range from less than 1 m to about 9 m.

Recharge to the upper glacial aquifer results mainly from infiltration of precipitation, infiltration of storm runoff, injection of water used for industrial purposes, and discharge of domestic and industrial wastewater from cesspools and septic-tank systems (Franke and Cohen, 1972). Depending upon factors such as lithology and soil moisture, the time required for water to move through the unsaturated zone to the water table ranges from a few hours (Seaburn and Aronson, 1974) to an estimated maximum of 16 months (Isbister, 1966, p. 49). Consequently, short-term variations in water quality due to cyclic variations in input rate, and concentration of typical substances, may be difficult to predict.

In general, north of the regional ground-water divide (fig. 1), ground-water movement is toward Long Island Sound. South of this divide, regional ground-water movement is generally toward the south shore of Long Island (Franke and Cohen, 1972).

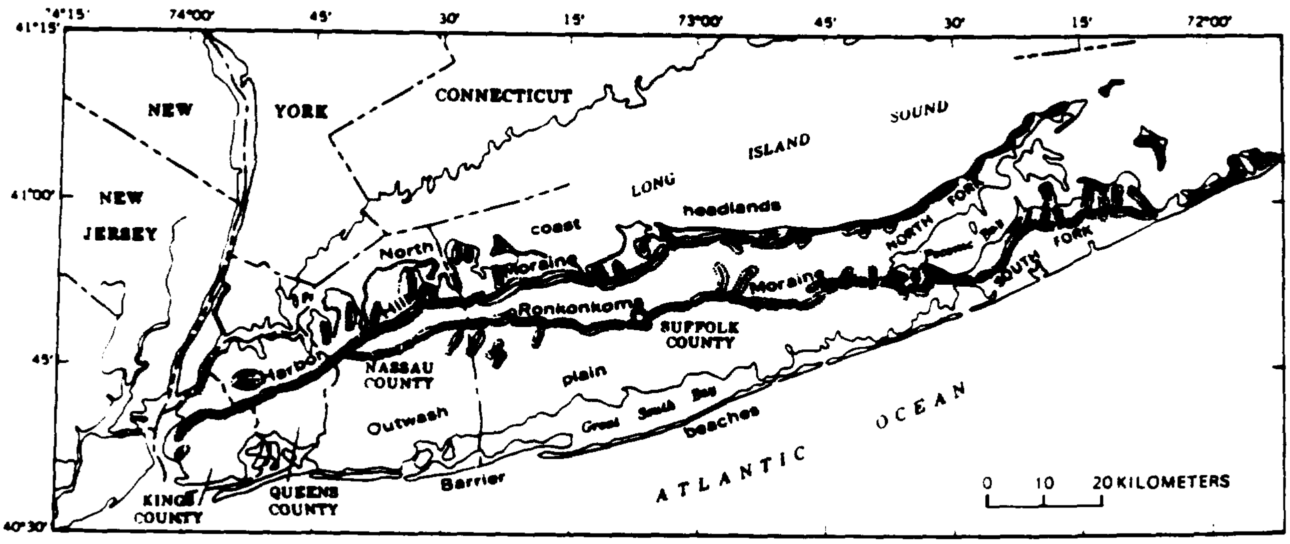

Figure 4.--Major physiographic features of upper glacial aquifer on Long Island.

SUMMARY AND CONCLUSIONS

Concentrations of chloride, nitrate and sulfate in shallow ground water were monitored for 1 year in areas receiving these dissolved constituents from nonpoint sources. Samples were collected monthly in sewered and unsewered suburban areas and in a rural unsewered area. During the period of sampling, maximum fluctuations of chloride concentrations in any particular well ranged from 2 to 300 mg/L; nitrate, from 0.2 to 10 mg/L; and sulfate, from 1 to 40 mg/L. Factors giving rise to these fluctuations include variations in (1) quality of precipitation, (2) application rates of fertilizers, (3) concentration of dissolved constituents in storm runoff, and (4) quality of sewage discharged to the ground.

The monthly and seasonal fluctuation of chloride, nitrate, and sulfate concentrations in ground water seems to correlate with temporal variations in discharge from specific nonpoint sources such as fertilizers, sewage, and storm runoff. No consistent correlation was noted between monthly variations of these substances in ground water and seasonal fluctuations in temperature or of the concentration of these substances in precipitation.

When long-term trends in ground-water quality are derived from scant data, it is of utmost importance to observe the magnitude of the short-term variations that may result from nonpoint sources. The magnitude of these short-term fluctuations could be larger than the actual long-term change in concentration, and this would lead to an incorrect assessment of possible trends toward an improvement or degradation in water quality.

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REFERENCE NO. 11

United States
Department of
Agriculture

Soil
Conservation
Service

in cooperation with
Cornell University Agricultural
Experiment Station

Soil Survey of Nassau County New York

In winter the average temperature is 33 degrees F, and the average daily minimum temperature is 27 degrees. The lowest temperature on record, which occurred at Mineola on January 27, 1976, is -1 degree. In summer the average temperature is 72 degrees, and the average daily maximum temperature is 81 degrees. The highest recorded temperature, which occurred at Mineola on July 3, 1966, is 103 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 42 inches. Of this, 21 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 16 inches. The heaviest 1-day rainfall during the period of record was 8.2 inches at Mineola on August 12, 1955 . Thunderstorms occur on about 22 days each year, and most occur in summer.

The average seasonal snowfall is 27 inches. The greatest snow depth at any one time during the period of record was 29 inches. On the average, 15 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 70 percent. The sun shines 65 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the west-northwest. Average windspeed is highest, 14 miles per hour, in spring.

Physiography and Geology

Bernard S. Ellis, geologist, Soil Conservation Service, assisted with this section.

Nassau County is part of the Coastal Plain physiographic province. The county is characterized by undulating or rolling landscapes in the northern part and a flat plain with a gently southward tilt in the southern part. A lobe of rolling topography protrudes farther to the south along the eastern edge of the county. Extensive tidal areas and marshes are just south of the plain, and a barrier beach and dunes form the southern outline of the county.

Elevation in the county ranges from sea level to about 340 feet above sea level near the eastern edge of the county, just south of NY Route 25. The landforms at the higher elevations were deposited as a terminal moraine. These areas have irregular topography that is crossed by deep glacial drainage channels near the north shore. These channels empty into deep bays on the north shore. The steepest relief is along drainage channels or on the side slopes adjacent to the bays. An outwash plain, which is to the south of the terminal moraine, has a maximum elevation of about 180 feet just northeast of Hicksville and slopes gradually to the south some 8 to 10 miles, finally reaching tidal areas at sea level.

Nassau County is underlain by bedrock, but most of it is at a depth of several hundred feet. The closest surficial bedrock is to the west in the boroughs of Bronx and Queens in New York City and areas to the northwest in Westchester County, near Long Island Sound. From these areas of surface exposure, the rock surface dips to the southeast to form a solid basement below Nassau County. Most of the bedrock consists of Cretaceous sedimentary layers (*3*). Some of the older rocks in the area are the 200-million-year-old Triassic red beds and lava flows off New Jersey and Connecticut and the Cambrian metamorphic rocks in the New York City area that are 450 million years old.

During the Late Cretaceous Period the sediments from the eroding Appalachian Highlands were carried by streams and rivers to low-lying coastal areas. The sand, silt, and clay of the Raritan and Magothy formations, which form the foundation of Long Island, were deposited as deltas in areas of shallow water. The Raritan formation is below sea level, and the Magothy formation is at the surface of several sites along the north shore.

During the Tertiary Period the area of Long Island was uplifted above sea level and the Cretaceous sediments were eroded and dissected by streams and rivers. The valley now occupied by Long Island Sound was cut by a major river, and smaller tributary streams formed valleys which are now the north shore bays.

During the Pleistocene Epoch of the Quaternary Period, several major glacial advances into the northern United States occurred. This epoch is divided into four major glacial stages. From oldest to youngest, they are: Nebraskan, Kansan, Illinoian, and Wisconsin. During the Illinoian advance, the ice sheet reached a position just north of the Long Island area. Outwash sand and gravel, of the Jameco gravel formation, was deposited by meltwater streams. Following the Illinoian stage, sea level rose close to its present level and a clay (Gardiners clay) containing marine fossils was deposited in the shallow coastal waters surrounding Long Island.

During the Wisconsin glacial advance, the ice reached a position represented on most of Long Island by the Ronkonkoma terminal moraine. In the latter part of this stage, the ice sheet receded from a point east of Lake Success and established a new position along the north shore marked by the Harbor Hill terminal moraine. West of Lake Success this lobe of ice overrode the Ronkonkoma moraine and pushed as far south as Staten Island. This caused the terminal moraine deposits in Nassau County to form a wide band of irregular topography occupying the northern half of the county, while in adjacent Suffolk County the terminal moraine deposits were far enough apart to be two distinct landforms separated by a flat plain. During the Wisconsin advance, sea level dropped about 350 feet below its current elevation to expose a broad, flat coastal plain.

As the climate again warmed about 11,000 years ago, the Wisconsin period ended and the Holocene, or present, period began. The ice sheet receded to its present polar limits, and sea level rose to its present level. Currents and wave action modified the outwash plain to create the present-day shoreline.

Drainage

A few perennial streams drain the county. The longer streams carry runoff water to the estuaries of the south shore. From west to east, they are Valley Stream, Mill River, East Meadow Brook, Bellmore Creek, and Massapequa Creek. A few shorter creeks, such as Hook, Motts, Powell, and Seaford Creeks, also drain toward the south shore.

Most of the drainage to the north shore is intermittent. Glen Cove Creek and Mill Neck Creek are the longest creeks that drain toward the north shore; other shorter, mostly intermittent creeks drain into the bays of the north shore. A sizable portion of the runoff that originates between NY Routes 25 and 25A enters the ground water by collecting in natural closed depressions · landlocked ponds.

Much of the runoff on paved surfaces in recently developed areas is recharged into the ground water system by routing it into dug pits or recharge basins.

Water Supply

The primary water supply in the county is underground aquifers. This source is in a saturated wedge-shaped mass of unconsolidated deposits that overlie nearly impermeable consolidated bedrock. There are two major types of aquifers: a confined aquifer with ground water under artesian pressure and an unconfined aquifer in a water table (*4*).

The contour of the surface of the water table of Nassau County is roughly the same as that of the landscape topography. The water table is closest to the surface at the terminal moraine and is deeper toward the coasts. The artesian pressure surfaces generally are a few feet lower than the water table near the middle of the island, and they are a few feet higher than the water table near the coasts.

The aquifer system is in recognizable separate units. The upper glacial, or water table, aquifer is at the least depth and is made up primarily of sand and gravel deposits from the most recent glacial period. Deeper in the unconsolidated deposits are layers of good water-bearing strata. These are the Jameco, Magothy, and Lloyd aquifers. The Lloyd is the deepest and rests on bedrock.

Initially most wells were drilled into the shallower strata. As the population increased and supplying water became a municipal effort, wells were drilled into deeper strata and the shallower aquifers became more polluted as the amount of cesspool discharge reaching those aquifers increased.

Since much of the county borders saltwater, the encroachment of salt into the freshwater layers is a hazard. This intrusion results because the fresh ground water, salty ground water, and salty sea water are interconnected. Generally, if the freshwater reservoir is pumped out at rates that exceed natural recharge from surface precipitation, saltwater will occupy the void.

Effects of Man and Urbanization

The landscape of Nassau County has changed drastically over the past 50 years. Extensive housing developments, shopping centers, industrial complexes, and business corridors now dominate areas where vast acreages of potatoes and other crops were once grown for markets in New York City. The large areas of well drained, nearly level soils have provided suitable sites for development. Rapid urbanization has created an ever-increasing demand for public services, waste-disposal facilities, and recreation areas.

The main relatively undisturbed open areas are in the southern part of the county. Most are in golf courses, municipal parks, greenbelts bordering parkways, scattered wildlife preserves along drainageways, tidal marshes, and barrier beaches. The soils immediately along the slope that are sites for houses, marinas, and park facilities, such as at Wantaugh Cow Meadow, Oceanside, Baldwin Harbor, and Bay Park, largely consist of dredgings from the bays and the ocean. These areas are mostly sandy soils that are variable in drainage due to the shallow depth of the water table. Many of these areas, including residences and small parks, experience inundation during abnormal high spring tides and winter storms. Soils in small parks, picnic areas, and athletic fields have often become compacted through intensive use, making planting and maintenance of grasses and shrubs difficult. Many areas within the larger parks, including Eisenhower Park, Bethpage State Park, and Restoration Village, the upper reaches of Valley Stream Park, and Hempstead Lake State Park, have retained much of their native quality, partly because of soil management to control erosion.

Some areas in the northern part of the county are still open and undisturbed. These areas are in a few vegetable and horse farms, areas of abandoned farms, large estates, partially wooded areas, preserve properties, and low-density or cluster subdivisions. The undulating to steep rolling glacial tills common to the north-central part of the county are variable in drainage, depending upon whether they are at the top of ridges or in low-lying pockets, and many of these soils have a

SOIL LEGEND

Publication symbols consist of letters or a combination of letters and a number (e.g., At, MkB, or RdD). The first letter, always a capital, is the initial letter of the soil name. The second letter is lower case and separates map units, except those that are slope phases, having names that begin with the same letter. The third letter, always a capital A, B, C, or D, indicates the slope. Symbols without a slope letter are for nearly level soils, soils named for higher categories, or for miscellaneous areas.

SYMBOL	NAME
At	Atsion loamy sand
Bc	Beaches
Bd	Berryland mucky loamy sand
Du	Dune land Udipsamments complex
EnA	Enfield silt loam, 0 to 3 percent slopes
EnB	Enfield silt loam, 3 to 8 percent slopes
Fr	Freetown muck
He	Hempstead silt loam
Ip	Ipswich mucky peat
Ma	Manahawkin muck
Mc	Matunuck mucky peat
MfA	Montauk fine sandy loam, 0 to 3 percent slopes
MfB	Montauk fine sandy loam, 3 to 8 percent slopes
MfC	Montauk fine sandy loam, 8 to 15 percent slopes
MfD	Montauk fine sandy loam, 15 to 25 percent slopes
MkA	Montauk silt loam, 0 to 3 percent slopes
MkB	Montauk silt loam, 3 to 8 percent slopes
Pa	Pawcatuck mucky peat
Pg	Pits, ground-water recharge
Pk	Pits, sand and gravel
PlB	Plymouth loamy sand, 3 to 8 percent slopes
PlC	Plymouth loamy sand, 8 to 15 percent slopes
PrD	Plymouth-Riverhead complex, 15 to 35 percent slopes
RdA	Riverhead sandy loam, 0 to 3 percent slopes
RdB	Riverhead sandy loam, 3 to 8 percent slopes
RdC	Riverhead sandy loam, 8 to 15 percent slopes
RdD	Riverhead sandy loam, 15 to 25 percent slopes
Sc	Scio silt loam
SdA	Scio silt loam, till substratum, 0 to 3 percent slopes
SdB	Scio silt loam, till substratum, 3 to 8 percent slopes
Su	Sudbury sandy loam
Ua	Udifluvents, rarely flooded
UdA	Udipsamments, nearly level
UdF	Udipsamments, steep
Ue	Udipsamments, wet substratum
Uf	Udorthents, refuse substratum
Ug	Urban land
Uh	Urban land-Hempstead complex
Um	Urban land-Mineola complex
UnB	Urban land-Montauk complex, 3 to 8 percent slopes
UnC	Urban land-Montauk complex, 8 to 15 percent slopes
UpA	Urban land-Plymouth complex, 0 to 3 percent slopes
UpB	Urban land-Plymouth complex, 3 to 8 percent slopes
UpC	Urban land-Plymouth complex, 8 to 15 percent slopes
UpD	Urban land-Plymouth complex, 15 to 25 percent slopes
UrA	Urban land-Riverhead complex, 0 to 3 percent slopes
UrB	Urban land-Riverhead complex, 3 to 8 percent slopes
UrC	Urban land-Riverhead complex, 8 to 15 percent slopes
Us	Urban land-Sudbury complex
Uu	Urban land-Udipsamments complex
Uw	Urban land-Udipsamments, wet substratum complex
Wa	Wallington silt loam
Wd	Walpole sandy loam

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label) — Indian Airport

- Small airport, airfield, park, oilfield, cemetery, or flood pool — FLOOD POOL

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate
- Federal
- State
- County, farm or ranch

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small — water, w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water, w
- Intermittent — int, i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — MkB UrA

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

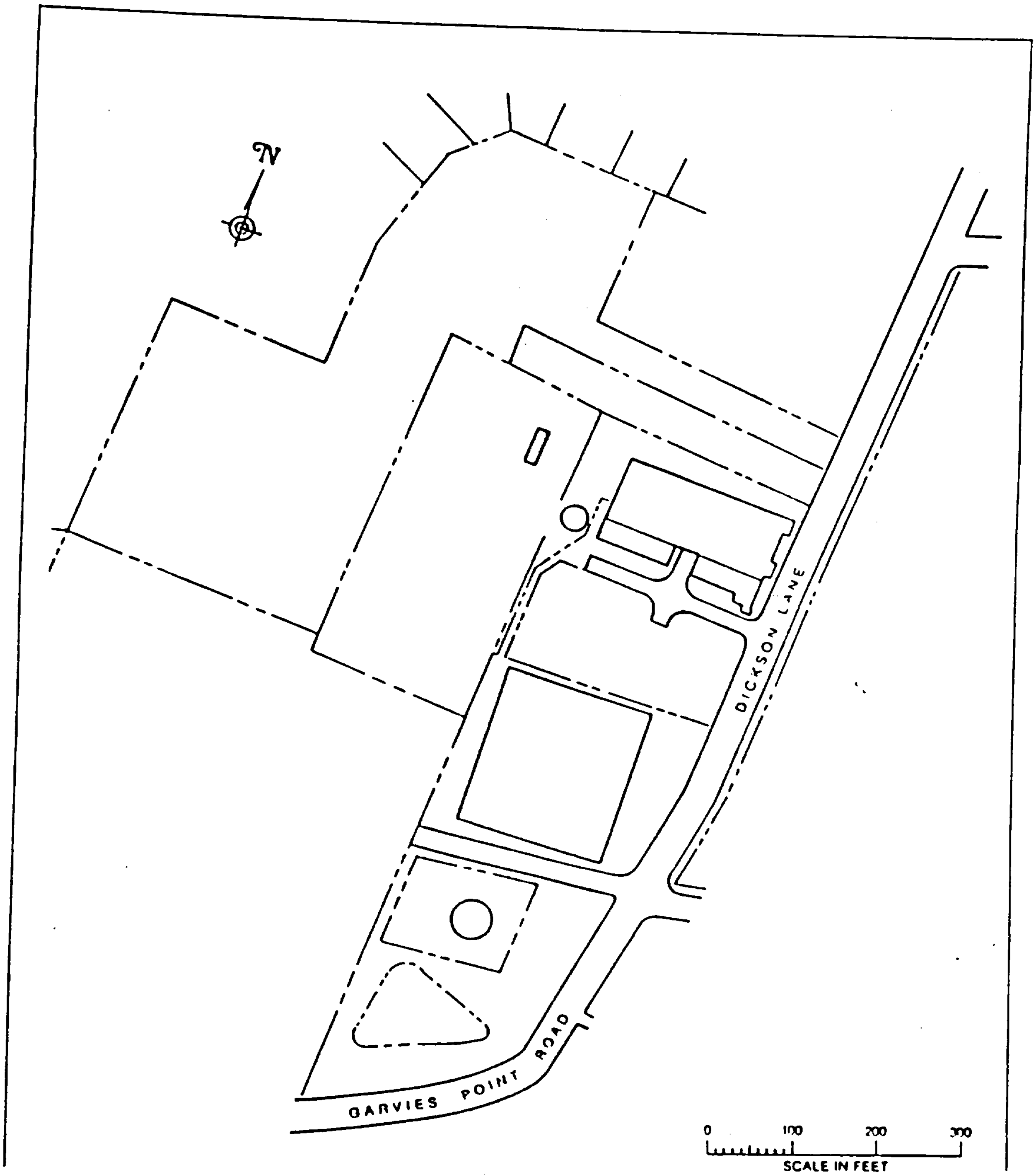
GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Groundwater recharge pit less than 2 ac.
- Area of Histosol ¼ to 2 acres



ENVIROPACT

TITLE: AREA C

SCALE: N/A

DRAWN BY: RTP

DATE: 4/25/88

PROJECT 4190-01

REVISED: -

DRAWING #4

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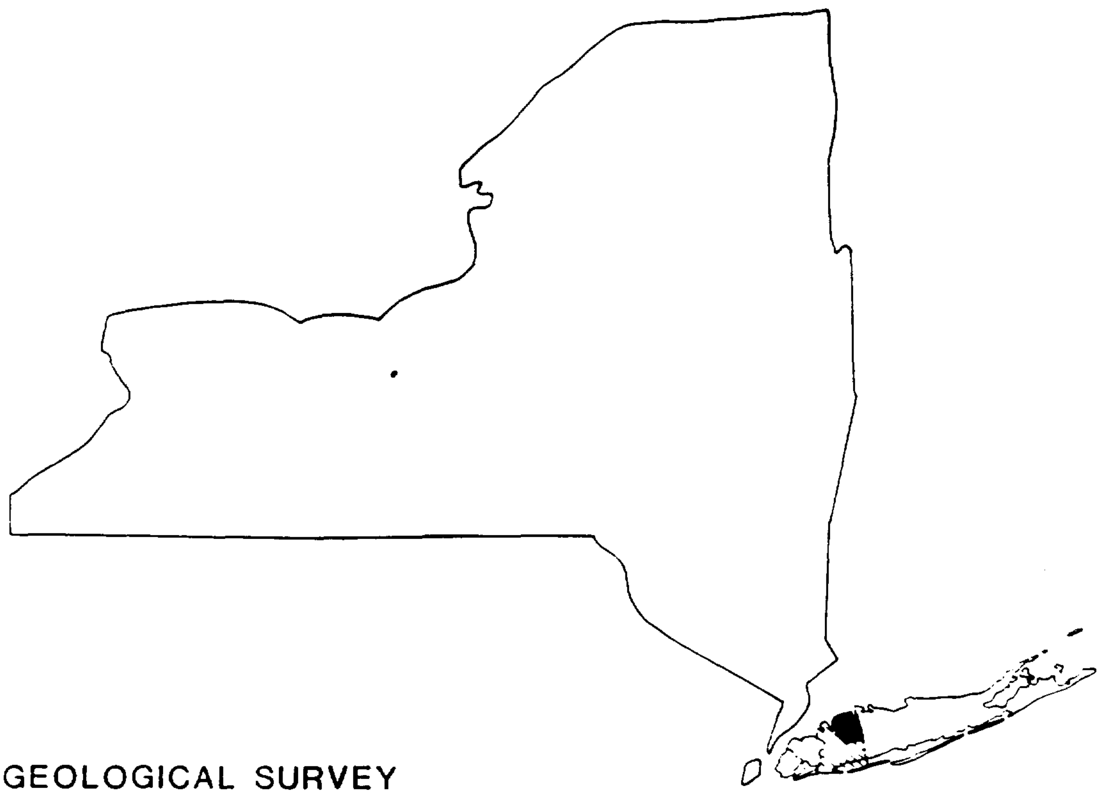
REFERENCE NO. 12

Hydrogeology and Ground-Water Quality of the Northern Part of the Town of Oyster Bay, Nassau County, New York, in 1980



U.S. GEOLOGICAL SURVEY
Water-Resources Investigations
Report 85-4051

Prepared in cooperation with
NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS

HYDROGEOLOGY AND GROUND-WATER QUALITY OF THE NORTHERN PART OF THE TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK, IN 1980

By Chabot Kilburn and Richard K. Krulikas

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Syosset, New York

1987

HYDROGEOLOGY

The ground-water reservoir underlying the northern part of the Town of Oyster Bay consists of unconsolidated glacial deposits of Pleistocene age and coastal-plain deposits of continental and marine origin of Late Cretaceous age. These unconsolidated deposits consist of gravel, sand, silt, and clay and are underlain by bedrock of early Paleozoic and (or) Precambrian age. The bedrock, which is relatively impermeable, forms the base of the ground-water reservoir.

The thickness, character, and water-bearing properties of the aquifer and the relationships between hydrogeologic and geologic units underlying the study area are depicted in table 1. The correlations should be considered direct relationships as implied in the tables. The upper and lower boundaries of the hydrogeologic units are determined mainly from gross lithologic differences between units rather the age of the deposits, which forms the basis for geologic correlations. For example, the upper and lower limits of the confining units (Port Washington confining unit and Raritan clay) are placed at intervals where the lithologic sequence changes from predominantly clay to sand or sand and gravel. and these positions may have no time-stratigraphic significance. For this reason, and because differentiation between sediments of Pleistocene and Cretaceous age is difficult and uncertain, it is possible that some deposits of Pleistocene age have been included in the upper part of the Magothy aquifer, which, by present definition, is approximately equivalent to the Magothy Formation-Matawan Group, undifferentiated, of Late Cretaceous age. The three hydrogeologic sections (pl. 1B) show the inferred extent, lateral and vertical relationships, and the variations in depth, thickness, lithology, and structure of these units.

Description of Hydrogeologic Units

Bedrock

Bedrock of early Paleozoic and(or) Precambrian age underlies all of western Long Island (Fisher and others, 1962). The bedrock generally consists of metamorphic and igneous crystalline rocks--schist, gneiss, and granite--and lies at depths ranging from about 350 ft below sea level along the north shore to about 950 ft below sea level in the southeast part of the study area (pl. 2A, and hydrogeologic sections, pl. 1B).

Bedrock is generally regarded as the base of the ground-water reservoir on Long Island because of its density and low permeability. No wells in the Town of Oyster Bay are known to obtain water from bedrock.

Lloyd Aquifer

The Lloyd aquifer is the equivalent of the Lloyd Sand Member of the Raritan Formation of Late Cretaceous age (Cohen and others, 1968, p. 18). It consists of discontinuous layers of gravel, sand, sandy clay, silt, and clay, and lies roughly parallel to the bedrock surface at depths ranging from about

200 ft below sea level along the north shore to about 700 ft below sea level in the southeast part of the study area (pl. 2B). Its thickness ranges from 0 to 250 ft from northwest to southeast, respectively.

The Lloyd aquifer is a major aquifer in the Town of Oyster Bay. It is probably hydraulically continuous with the adjacent Port Washington aquifer and upper glacial aquifer in the northern part of the study area. Water in the Lloyd aquifer is confined under artesian pressure beneath the Raritan clay.

Well yields during test pumping of large-capacity public-supply wells screened in the Lloyd aquifer have ranged from 500 gal/min to as much as 1600 gal/min.

Raritan Clay

The Raritan clay is a distinct hydrogeologic unit that extends throughout much of the Town of Oyster Bay (pl. 3A). In this area, the Raritan clay may be equivalent to the unnamed clay member of the Raritan Formation of Late Cretaceous age. The Raritan clay consists mainly of light to dark gray, red, white, or yellow clay and variable amounts of silt, and clayey silty fine sand. Sandy beds of varying thickness are common. The top of the Raritan clay is roughly parallel to that of the underlying Lloyd sand member. The upper-surface altitude of the Raritan clay ranges from 150 ft below sea level along the north shore to about 550 ft below sea level in the southeastern part of the study area. Its thickness ranges from 0 to 200 ft from northwest to southeast, respectively.

The Raritan clay is a significant hydrogeologic unit because it confines water in the underlying Lloyd aquifer. Although its hydraulic conductivity is very low, it does not entirely prevent movement of water between the Magothy and Lloyd aquifers. Some public-supply and other wells obtain part of their water supply from the sandy zones in the upper part of the Raritan clay.

Magothy Aquifer

The Magothy aquifer is the equivalent of the Matawan Group-Magothy Formation undifferentiated of upper Cretaceous age. Deposits in this unit consist of beds and lenses of light-gray, fine to coarse sand with some interstitial clay. Detailed lithologic descriptions are given in Soren (1978); Ku and others (1975); and Jensen and Soren (1974).

The top of the Magothy aquifer is not planar, unlike the surfaces of the underlying units. The Magothy surface was deeply eroded during Tertiary time and probably was considerably eroded in Pleistocene time. The upper surface altitude of the Magothy ranges from as high as 200 ft above sea level in the center of the study area to 200 ft below sea level along the northeast edge of the study area (pl. 3B). Its thickness ranges from 0 to 650 ft from northwest to southeast, respectively.

The Magothy aquifer is the principal aquifer underlying Long Island and is the island's main source of water for public supply. The sand beds within the aquifer are moderately to highly permeable. The reported yields during pumping tests of several public-supply wells screened in the Magothy aquifer in the Town of Oyster Bay ranged from 300 gal/min to as much as 1,500 gal/min. The average yield was about 1,000 gal/min.

The large amount of clay in the upper half of the aquifer causes the water to become increasingly confined with depth. Along the north shore, the Magothy aquifer is probably in hydraulic continuity with the adjacent Port Washington aquifer. The Magothy also has a generally high degree of hydraulic continuity with the overlying upper glacial aquifer, but the degree of continuity may vary considerably from place to place.

Port Washington Aquifer

Two previously unrecognized hydrogeologic units in the northern part of the Town of Oyster Bay are defined as the Port Washington aquifer and Port Washington confining unit. The units were first recognized in the northern part of the Town of North Hempstead (Kilburn, 1979). The inferred limits of the units are shown in plates 4A and 4B, and their relationships to the other hydrologic units are shown on the hydrogeologic sections on plate 1B.

The Port Washington aquifer is a sequence of deposits of Pleistocene and (or) Late Cretaceous age that underlie the north-shore area of the Town of Oyster Bay. The deposits form a distinct hydrogeologic unit that rests upon bedrock and is overlain by a thick sequence of confining clay. The south edge of the deposits overlap and abut the adjacent Cretaceous units. The sediments of the Port Washington aquifer form part of the valley fill in the channels cut into the Cretaceous deposits. These deposits consist largely of sand or sand and gravel and varying amounts of interbedded clay, silt, and sandy clay.

The altitude of the top of the Port Washington aquifer ranges from 150 ft below sea level along the north shore to 450 ft below sea level along the south shore (pl. 4A). Its thickness ranges from 0 to more than 150 ft in the central parts of the study area.

The Port Washington aquifer is moderately to highly permeable and is a major aquifer in the northern parts of the Town of Oyster Bay. The reported yields during pumping tests of public-supply wells screened in the aquifer range from 300 gal/min to 1,200 gal/min. Water in the aquifer is confined beneath the Port Washington confining unit. The hydrogeologic relationships between the Port Washington aquifer and the abutting Lloyd, Magothy, and upper glacial aquifers, as shown in the hydrogeologic sections on plate 1B, suggest that these deposits could be in lateral hydraulic continuity. Potentiometric studies of the head in the Lloyd aquifer made by Swarzenski (1963), Kimmel (1973), and Kilburn (1979) tend to verify a lateral hydraulic continuity between the Port Washington and Lloyd aquifers.

Port Washington Confining Unit

The Port Washington confining unit is a sequence of deposits of Pleistocene or Late Cretaceous to Holocene(?) age that locally underlies the north shore. The unit consists mainly of clay and silt, with scattered lenses of sand or sand and gravel. (See Kilburn, 1979, for a more detailed description.) The deposits that form the Port Washington confining unit overlie the Port Washington aquifer or overlap the adjacent Cretaceous units and may form part of the valley fill that occupies channels cut into the other Cretaceous deposits. The unit may locally include or consist of erosional remnants of the clay member of the Raritan Formation.

The altitude of the top of the Port Washington confining unit ranges from 100 ft above sea level in the central part of the study area to 300 ft below sea level along the northeastern part (pl. 4B). Its thickness ranges from 0 to more than 150 ft in the central part of the study area.

Upper Glacial Aquifer

The upper glacial aquifer consists of deposits of late Pleistocene and Holocene age that overlie the Magothy aquifer and the Port Washington confining unit and locally abut against or overlie the Port Washington aquifer. The extent and relationships of these deposits to the adjacent hydrogeologic units are shown on plate 1B.

The upper deposits consist mainly of stratified beds of fine to coarse sand and of sand and gravel but also contain thin beds of silt and clay interbedded with coarse-grained material. The outwash that constitutes the bulk of the upper Pleistocene deposits is yellow and brown or, in some places, gray. (See Perlmutter, 1949, and Kilburn, 1979, for further descriptions.)

The upper glacial aquifer, which contains the water table in most of the area, transmits all recharge to the underlying aquifers. Precipitation filtering downward to the water table is the principal source of ground-water recharge. In the past, the upper glacial aquifer was tapped as a water supply by many public-supply wells. Because it has become contaminated by cesspool effluents, fertilizers, and other substances, however, its use for public supply has decreased. Wells tapping the aquifer are now used mainly to supply water for domestic use, irrigation, and commercial and industrial purposes.

The sand and gravel deposits in the upper glacial aquifer are highly permeable and yield large amounts of water to properly constructed wells. The yields of large-capacity public-supply wells screened in the aquifer have been reported to range from 400 gal/min to 1,400 gal/min.

The recent deposits of Holocene age along beaches, streams, swamps, and the bottoms of bays and lakes have not been differentiated from the upper glacial aquifer because they are too thin.

Correlation of Units

The differentiation between deposits of Pleistocene and Cretaceous age throughout most of the northern part of the Town of Oyster Bay is uncertain. On Long Island, the contact between Pleistocene and Cretaceous deposits is an erosional unconformity that is commonly marked by an abrupt lithologic and

Water Movement

The lateral direction of ground-water flow can be estimated from water-table and potentiometric-surface maps. Ground water moves in the direction of decreasing head and perpendicular to the potentiometric contours. A vertical component of ground-water flow may also develop where differences in hydrostatic head are present with depth in an aquifer or between aquifers.

Upper Glacial Aquifer

The regional and local directions of lateral ground-water movement near the water table in the northern part of the Town of Oyster Bay are controlled from the regional and local ground-water divides (pl. 6A). Other smaller, local ground-water divides (not shown) are present on Mill Neck, Centre Island, and Cove Neck.

The lateral direction of ground-water movement near the water table is indicated on plate 6A by arrows. Water on the south side of the regional divide moves southward to discharge areas along the south shore; water north of the regional divide moves in two directions. Ground water east of the principal local divide shown on plate 6A moves toward discharge areas along or underlying Long Island Sound, Mill Neck Creek, Oyster Bay Harbor, or Cold Spring Harbor, and ground water west of the principal local divide moves westward to discharge areas along Glen Cove Creek or into Hempstead Harbor. Some water along the divides moves directly downward until it meets a zone of low permeability (for example, a clay bed or the top of the Port Washington confining unit or the Raritan confining unit), where it is diverted laterally.

Hydrostatic head differences between the water table (pl. 6A) and the potentiometric surface in the lower part of the Magothy aquifer (pl. 5A) during March and April 1980 ranged from less than 1 ft to more than 20 ft throughout most of the area except near the shore. The head differences were such that recharge from the water table could move downward into the Magothy aquifer over most of the area. Cones of depression due to local ground-water pumpage are not shown on plate 6A because the observation wells in the area are spaced too broadly to provide adequate definition.

Magothy Aquifer

The directions of lateral and vertical ground-water movement in the Magothy aquifer are controlled by the position of the regional and local potentiometric divides and by the hydraulic gradients. (See pl. 5A.) Some of the ground water along the divides moves downward to the bottom of the aquifer, where it then moves laterally toward areas of natural discharge or active pumping wells.

The areas of natural discharge from the Magothy aquifer can be inferred from plates 5A and 6A. Discharge occurs wherever the hydrostatic head in the Magothy is greater than that in the adjacent or overlying units. Water discharges from the Magothy aquifer into the upper glacial aquifer in areas adjacent to Hempstead Harbor and Oyster Bay Harbor, and into the Port Washington confining unit elsewhere.

Hydrostatic heads in the Magothy aquifer in 1980 exceeded those in the Lloyd aquifer by as much as 50 ft throughout a large part of the area. This is due largely to the low permeability of the Raritan confining unit, which confines water in the Lloyd aquifer but does not prevent water from the areas of higher head in the Magothy from moving in the direction of decreasing head and perpendicular to the potentiometric contours.

Lloyd Aquifer

The Lloyd aquifer is recharged by water moving downward from the Magothy and upper glacial aquifers through the Raritan clay and Port Washington confining unit in response to the higher hydrostatic heads in the upper aquifers. The confining units impede but do not prevent this downward movement. The principal areas of recharge of the Lloyd aquifer are those underlying and adjacent to the regional and local potentiometric divides, where flow is predominantly downward (pl. 5B).

Areas of natural discharge of water from the Lloyd aquifer can be inferred from a comparison of heads in the Lloyd (pl. 5B), the Magothy (pl. A), and the water table (pl. 6A). Natural discharge from the Lloyd may occur in areas where the head in the Lloyd exceeds heads in overlying or adjacent units. These comparisons indicate that water from the Lloyd aquifer can move laterally and upward through the Port Washington aquifer (where present) and into the upper glacial aquifer, and thence into Hempstead Harbor (section C-C', pl. 1B). Other areas of discharge are along and beneath Long Island Sound (section A-A', pl. 1B). Some discharge may also occur in the Oyster Bay Harbor area (section C-C', pl. 1B) by movement of water upward through the Port Washington aquifer and Port Washington confining unit into the upper glacial aquifer and then into the harbor.

GROUND-WATER QUALITY

Data on ground-water quality in the northern part of the Town of Oyster Bay during 1950-79 are available mainly from analyses made by the Nassau County Department of Health. These analyses, together with those made by the U.S. Geological Survey, represent 155 wells. The number of samples per well during this period ranged from 1 to 37. The frequency of sampling varied, as did the constituents for which analyses were made. It was beyond the scope of this study to make a detailed study of water quality or to review the 2,168 analyses for obvious errors. It was assumed that the number of analyses in error was small enough to not significantly affect general interpretations of water quality that could be made from the analyses.

General Water Quality

Table 3 (p. 22) lists the median and range of the principal constituents and summarizes the general water quality of the three aquifers during 1950-79; Table 4 summarizes the ground-water quality in the northern part of the Town of Oyster Bay in 1979. The analyses are arranged by aquifer to facilitate comparison and to demonstrate changes with depth.

Table 4.--Chemical analyses of ground water f[illegible] wells in northern part of Town of Oyster Bay, 1[illegible].

[Concentrations in milligrams per liter unless otherwise indicated. Analyses by Nassau County Department of Health except as indicated. Dashes indicate no measurement recorded.]

Well data				Constituents					
Well number[1]	Date of sample	Depth of well (ft)	Use of well[3]	Specific conductance (μmho)	pH	Hardness (as $CaCO_3$)	Calcium dissolved (as Ca)	Magnesium dissolved (as Mg)	Sodium dissolved (as Na)
				Upper Glacial aquifer					
N1194A[2]	6- 7-79	100	Obs.	360	5.7	90	26	6.1	40
N1209A	8-21-79	64	Obs.	--	5.9	72	18	.5	33
N2072[2]	9- 9-75	159	P.S.	25	5.2	8	2.0	.8	2.9
N3892	6-28-77	251	P.S.	170	6.4	42	9.6	.4	10
N5792	12-27-76	300	P.S.	50	6.4	56	14	.4	10
N7034	9-19-79	232	Irr.	--	6.3	80	18	.7	11
N7643	4- 5-78	218	P.S.	320	5.7	64	11	.7	50
N7665	4-10-79	375	P.S.	--	6.3	60	14	.5	12
N8183	1- 2-79	230	P.S.	150	6.3	47	11	.4	10
				Magothy aquifer					
N3475	10-12-77	487	P.S.	65	6.4	15	2.8	0.2	5.1
N4097	3-26-79	470	P.S.	95	5.3	20	5.2	.1	7.4
N4400	1- 2-79	302	P.S.	88	7.0	25	5.2	.2	6.0
N5762	6-28-77	283	P.S.	140	6.6	38	8.8	.3	7.0
N6093	1-23-79	612	P.S.	40	5.6	8	1.6	.1	3.0
N6768	3-13-78	208	Inst.	--	6.3	54	12	.5	6.0
N7030	1-23-79	531	P.S.	140	6.3	44	11	.3	10
N7772	2-16-79	568	P.S.	70	6.4	20	5.6	.1	5.0
N8355	8- 9-78	595	P.S.	--	6.2	30	5.6	.3	6.0
N8713	7-31-78	377	P.S.	70	6.5	16	4.0	.1	4.0
				Lloyd aquifer					
N 118	7-11-79	477	P.S.	65	6.9	18	4.0	0.2	4.9
N2920	9-12-77	--	P.S.	75	6.9	22	4.8	.2	10
N5201	7-31-78	509	P.S.	55	6.6	12	3.2	.1	.0
N7614	2-26-79	393	Ind.	--	6.6	14	2.4	.2	4.0
N7857	8-10-79	614	P.S.	41	6.1	14	4.0	.1	--
N8776	8-28-79	459	P.S.	46	6.5	10	2.4	.1	3.8

Closest drinking well

[1]Well locations are shown in plate 1.
[2]Analyses by U.S. Geological Survey.

Well number[1]	Carbonate (as CO_3)	Alkalinity total (as $CaCO_3$)	Sulfate dissolved (as SO_4)	Chloride dissolved (as Cl)	Silica dissolved (as SiO_2)	Solids residue at 180°C	Solids (sum of dissolved constituents)	Nitrogen Nitrate, dissolved (as N)	Iron total (µg/L as Fe)
	Constituents (Continued)								
				Upper Glacial aquifer					
N1194A[2]	0	25	29	82	13	--	214	2.3	810
N1209A	28	14	35	44	--	267	--	12	1,580
N2072[2]	0	4	.4	3.0	6.8	--	22	.71	60
N3892	14	16	11	17	--	155	--	3.2	230
N5792	20	20	9.0	13	--	153	--	4.4	60
N7034	28	14	36	23	--	209	--	8.7	200
N7643	17	10	54	41	--	302	--	19	0
N7665	20	14	32	11	--	190	--	4.4	110
N8183	17	20	7.0	14	--	113	--	6.4	0
				Magothy aquifer					
N3475	4	12	0.0	6.5	--	33	--	2.0	100
N4097	8	4	.0	11	--	28	--	6.3	0
N4400	8	24	4.0	5.0	--	75	--	2.1	150
N5762	13	20	12	9.2	--	102	--	2.8	280
N6093	2	2	.0	4.0	--	53	--	1.3	60
N6768	18	14	33	7.8	--	116	--	2.9	260
N7030	17	10	18	10	--	102	--	4.5	190
N7772	8	12	.0	7.4	--	56	--	1.9	0
N8355	8	24	.0	10	--	67	--	3.5	0
N8713	6	9	.0	5.6	--	66	--	1.7	0
				Lloyd aquifer					
N 118	6	17	3.0	5.0	--	56	--	2.0	50
N2920	7	16	.0	4.8	--	71	--	.73	130
N5201	5	13	.0	4.6	--	58	--	.02	100
N7614	4	12	.0	5.0	--	53	--	1.0	210
N7857	6	15	.0	8.0	--	76	--	.00	--
N8776	4	12	.0	2.5	--	33	--	.00	0

[3] Obs., observation well; P.S., public supply well; Irr., irrigation well; Inst., institutional well; Ind., industrial well.

Table [illegible].--Wells in northern part of Town of Oyster Bay that are closed or restricted because of contamination by nitrates or volatile organic chemicals.

(Locations of wells are shown in pl. 1 and pl. 6B; dashes indicate data unavailable).

Well number	Well owner or user[1]	Screened interval or depth (feet below land surface)	Aquifer	Date: Closed or abandoned	Date: Restricted or reopened	Contaminants
N 149	Hicksville W.D.	153	Upper Glacial	1967	--	Nitrate
150	Hicksville W.D.	148	Upper Glacial	1953	--	Nitrate
2072	Hicksville W.D.	138-159	Upper Glacial	1967	--	Nitrate
2316	Pall Corp.	170	Upper Glacial	--	07/13/77	1,1,2 Trichloroethylene
3466	City of Glen Cove	148-173	Upper Glacial	06/23/77	--	1,1,2 Trichloroethylene
N 3892	City of Glen Cove	139-172	--	--	--	--
		225-246	Upper Glacial	07/07/77	--	Tetrachloroethylene
3953	Hicksville W.D.	169-213	--	--	--	--
		371-419	Magothy	--	07/06/79	Nitrate
4097	Plainview W.D.	413-463	Magothy	12/28/76	06/13/77	1,1,2 Trichloroethylene, 1,1,1 Trichloroethane
4246	Jericho W.D.	403-453	Magothy	05/06/77	--	1,1,1 Trichloroethane
5261	City of Glen Cove	131-170	--	--	--	--
		185-195	Port Washington	--	--	--
		220-230	confining unit	08/14/78	--	Tetrachloroethylene
N 6191	Hicksville W.D.	489-550	Magothy	--	1973	Nitrate
6531	Riverside Plastics	114-119	Upper Glacial	--	09/06/78	1,1,1 Trichloroethane Trichloroethylene
6579	Glen Components	130-146	Upper Glacial	--	08/10/77	Trichloroethylene
7427	Photocircuits	120-161	Upper Glacial	--	07/25/77	Trichloroethylene
7643	Village of Bayville	159-218	Upper Glacial	--	1967	Nitrate
N 7664	Engineer's Country Club	58-79	Upper Glacial	--	06/06/78	Tetrachloroethylene
8326	City of Glen Cove	120-165	Upper Glacial	06/13/77	--	1,1,2 Trichloroethylene Tetrachloroethylene
8327	City of Glen Cove	118-168	Upper Glacial	06/23/77	--	1,1,2 Trichloroethylene Tetrachloroethylene
8880	Metco Inc.	221-247	Magothy	--	05/05/78	Trichloroethylene
8887	Slater Electric	105-130	Upper Glacial	--	07/13/77	Trichloroethylene

[1] W.D. = Water District

EXPLANATION OF COLUMN HEADINGS AND ABBREVIATIONS USED IN TABLE 6

Well Number

Well numbers are assigned by the New York State Department of Environmental Conservation. The prefix N designates Nassau County.

Owner or Well User

The owner or well user is in most cases the name shown on the completion report that was sent to the New York State Department of Environmental Conservation by the driller. During this study, it was found that many of the wells have changed ownership or user. New owners or well users are listed if known.

The following abbreviations are used in the "owner/user" column:

AM. PHYSICS INST	American Institute of Physics
ASSOC	Associates
BAYVILLE	Village of Bayville
BEAVER DAM CLUB	Beaver Dam Winter Sports Club
CC	Country Club
CERRO WIRE	Cerro Wire and Cable Co.
CERTIFIED IND	Certified Industries
CERT. REDI MIX	Certified Redi-Mix Co., Inc.
CL	Club
CO	Company
C.W. POST COLL.	C.W. Post Center of Long Island University
FABRIC LEATHER	Fabric Leather Corp.
FAIRCHILD CORP.	Fairchild Space and Defense Systems
GENERAL INST.	General Instrument Corp.
GLEN COVE	City of Glen Cove
GLEN COVE BOT.	Glen Cove Bottling Co.
GLEN COVE HOSP.	The Community Hospital at Glen Cove
INC	Incorporated
KOLLSMAN INST.	Kollsman Instrument Co.
LOCUST VLY WD	Locust Valley Water District
L.I. LIGHTING CO.	Long Island Lighting Co.
L.I. RAILROAD CO.	Long Island Railroad Co.
L.I. STATE PARK	Long Island State Park and Recreation Commission Planting Field Arboretum
L.I. TUNGSTEN	Li Tungsten Corp.
MILL NECK ESTS.	Association of Owners of Mill Neck Estates
NASSAU CO DPW	Nassau County Department of Public Works
NASSAU CO WTR	Nassau County Water Co.
NATL. PARK SERV	National Park Service
NEW YORK STATE	New York State Conservation Department Cold Spring Harbor Hatchery
OLD WESTBURY	Village of Old Westbury
OYSTER BAY	Town of Oyster Bay
PIPING ROCK WTR	Piping Rock Water Co.
POWERS CHEMCO	Powers Chemco, Inc.
REG. PLAN. BOARD	Nassau-Suffolk Regional Planning Board
RIVESIDE PLAS.	Riverside Plastics Corp.
ST. PATRICKS	Saint Patrick's Roman Catholic Church
ST. UNIV. AT O.W.	State University of New York College at Old Westbury

EXPLANATION OF COLUMN HEADINGS AND ABBREVIATIONS USED IN TABLE 6 (Continued)

SEA CLIFF WTR	Sea Cliff Water Co.
SEL-VRA ACRES	Association of Property Owners of SEL-VRA Acres
U.S. GEOL. SURV	U.S. Geological Survey
WD	Water District

Map Coord

Locations of wells are given by map coordinates, based on a latitude and longitude grid system, to aid the reader in locating the wells shown in plate 1. In this system, 5-minute intervals of latitude are lettered consecutively from south to north, and 5-minute intervals of longitude are numbered consecutively from west to east. The grid coordinates are shown along the margins of plate 1.

Year Completed

Year completed refers to the year in which the well was reported to have been completed or accepted by the original well owner. It may not always be the year in which the well was actually drilled, however.

Altitude of Land-Surface Datum (LSD)

The altitude of land surface at the well was estimated from U.S. Geological Survey 7-1/2-minute quadrangle topographic maps. At most observation wells, however, land-surface elevation was estimated from spirit leveling of the altitude of the measuring points of the wells and is probably accurate to the nearest foot.

Use of Water

The following abbreviations indicate the primary purpose for which water from the well is used:

ARCD	air conditioning	IRR	irrigation
COM	commercial	OTHR	other
DOM	domestic	P.S.	public supply
INST	institutional	RECH	recharge
IND	industrial	UNSD	unused

Use of Well

The following abbreviations indicate the principal use of the well or the purpose for which the well or hole was drilled:

DEST	well or hole destroyed	TEST	test hole
OBS	observation well	UNSD	well unused
RECH	recharge water	WTDR	withdrawal of water

Depth of Well

The figures give well depth or total depth of the drilled test hole, in feet below land surface.

EXPLANATION OF COLUMN HEADINGS AND ABBREVIATIONS USED IN TABLE 6 (Continued)

Screen Setting and Total Screen Length

The altitudes of the top and bottom of the screened interval are given in feet above or below (-) sea level. The total length of screen or perforated pipe in that interval is given in feet. In some wells, screen was set at two or more intervals; in such cases the differences between the altitudes of the two screen settings is different from the total screen length.

Diameter of Well

The diameter of the well is the nominal inside diameter of the smallest or innermost casing at land surface, in inches.

Water Level (feet below land-surface datum)

The water level given is the reported original static water level, in feet above or below land surface, when the well was completed.

Date of Measurement

Date of water-level measurement is by month (M), day (D), and year (Y).

Lift Type

The following abbreviations indicate the type of pump or other conveyance used to bring water to the surface:

CENT	centrifugal	TURB	turbine
JET	jet	NONE	no pump in well
SUBM	submersible	OTHR	some other type of lift

Aquifer Developed

The following abbreviations indicate the hydrogeologic unit that yields water to the well. Where two or more units yield water to the well, the probable principal unit is given:

UPGLAC	Upper glacial aquifer	MAGOTHY	Magothy aquifer
PTWCU	Port Washington confining unit	LLOYD	Lloyd aquifer
PTWAQ	Port Washington aquifer		

Specific Capacity

The value in this column is the number of gallons per minute pumped from the well per foot of drawdown in the well, as reported by drillers.

Abbreviations

COORD	coordinates	IN	inches
D	day	LSD	land surface datum
DIAM	diameter	M	month
FT	feet	MEAS	measurement
GPM/FT	gallons per minute pumped per foot of drawdown in well	SL	sea level
		Y	year

Wells within 3 miles of Li Tungsten are marked as such --

TABLE 6.--WELL COMPLETION DATA ON SELECTED WELLS AND TEST HOLES IN NORTHERN PART OF TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK.

WELL NUMBER	OWNER OR WELL USER	MAP COORD.	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE SEA LEVEL)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) SEA LEVEL	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY [(GAL/MIN)/FT]
N 107	OLD WESTBURY	D 6	1935	212	P.S.	WTDR	506	-243 TO -279	36	16	132	08-18-35	TURB	MAGOTHY	1
— N 109	JERICHO WD	D 6	1925	48	UNSD	DEST	529	-384 TO -465	59	16	26	06-27-24	NONE	LLOYD	20
— N 110	JERICHO WD	D 6	1924	56	UNSD	OBS	519	-389 TO -459	70	16	24.0	07-05-24	NONE	LLOYD	13
— N 112	GLEN COVE	E 6	1930	53	UNSD	DEST	169	-79 TO -116	37	15			NONE	UPGLAC	
— N 114	NASSAU CC	E 6	1910	123	IRR	WTDR	117	30 TO 10	20	10				MAGOTHY	
— N 115	LOCUST VLY WD	E 6	1925	75	UNSD	UNSD	416	-265 TO -332	67	18			TURB	PTWAQ	7
— N 116	LOCUST VLY WD	E 6	1925	80	UNSD	UNSD	256						NONE	UPGLAC	
— N 117	LOCUST VLY WD	E 6		77	UNSD	UNSD	155			16			NONE	UPGLAC	
— N 118	LOCUST VLY WD	E 6	1932	65	P.S.	WTDR	477	-347 TO -406	59	24			TURB	LLOYD	19
— N 119	LOCUST VLY WD	E 6	1935	80	P.S.	WTDR	572	-417 TO -491	74	18			TURB	LLOYD	29
— N 120	LOCUST VLY WD	E 6	1933	80	UNSD	TEST	559						NONE		
— N 121	CREEK CLUB	E 6	1933	120	UNSD	TEST	415						NONE		
— N 121	CREEK CLUB	E 6	1933	120	IRR	WTDR	219	-29 TO -87	42	12	56.5	10-00-33	TURB	UPGLAC	26
N 124	CREEK CLUB	E 6	1920	9	UNSD	OBS	390			12			NONE	LLOYD	
N 149	HICKSVILLE WD	D 7		161	UNSD	UNSD	153							UPGLAC	
N 150	HICKSVILLE WD	D 7		161	UNSD	DEST	148							UPGLAC	14
N 166	PIPING ROCK WTR	E 7	1936	55	UNSD	UNSD	118	-43 TO -63	20	6	4.8	11-19-36	NONE	MAGOTHY	28
N 167	PIPING ROCK WTR	E 7	1936	55	UNSD	UNSD	123	-45 TO -65	20	6			NONE	MAGOTHY	
N 173	M.C.TAYLOR	E 7	1920	38	DOM	WTDR	398		11	6	19.5	03-00-20	TURB	LLOYD	
N 198	JERICHO WD	D 8	1930	240	P.S.	WTDR	628	-327 TO -377	50	18			TURB	MAGOTHY	37
N 199	JERICHO WD	D 8	1930	235	P.S.	WTDR	611	-309 TO -365	56	18			TURB	MAGOTHY	28
N 202	OYSTER BAY WD	E 7		18	UNSD	UNSD	420						NONE	LLOYD	
N 486	A.HUTCHINSON	E 7		3			190			5					
N 511	W.P.WOODBRIDGE	E 7	1905	11	UNSD	OBS	359		6	3			NONE	PTWAQ	
N 551	NATL. PARK SERV	E 7		154	UNSD	UNSD	325							PTWCU	
N 570	JERICHO WD	D 8	1937	237	P.S.	WTDR	600	-323 TO -363	40	18	178	07-15-37	TURB	MAGOTHY	66
N 576	L.I.RAILROAD CO	D 7	1935	144	UNSD		409	-255 TO -265	10	8			NONE	MAGOTHY	
N 585	OYSTER BAY WD	E 7	1937	18	P.S.	WTDR	78	-39 TO -59	20	12	2	09-03-37	OTHR	UPGLAC	15
N 590	NATL. PARK SERV	E 8	1937	120	DOM	WTDR	165	-32 TO -42	10	8	130	07-21-37		PTWCU	6
N 613	PIPING ROCK WTR	E 7	1937	55	UNSD	DEST	140	-61 TO -81	20	6	5.5	12-10-37	NONE	MAGOTHY	18
N 614	PIPING ROCK WTR	E 7	1937	55	UNSD	UNSD	122	-44 TO -64	20	6	4.5	12-28-37	NONE	MAGOTHY	28
N 638	OLD WESTBURY CC	D 6	1938	295	IRR	WTDR	560	-250 TO -265	15	12	209	00-00-62	TURB	MAGOTHY	3
— N 660	POWERS CHEMCO	E 6		58	IND	WTDR	404			15			TURB	LLOYD	
— N 661	POWERS CHEMCO	E 6	1939	60	UNSD	UNSD	403	-264 TO -340	70	10			NONE	LLOYD	11
N 733	OYSTER BAY WD	E 7		18	UNSD	DEST	350			6			NONE	PTWAQ	
N 734	OYSTER BAY WD	E 7		18	UNSD	UNSD	420			10			NONE	LLOYD	12
N 735	OYSTER BAY WD	E 7		18	P.S.	WTDR	100						OTHR	UPGLAC	
N 736	OYSTER BAY WD	E 7		20	P.S.	WTDR	70			6			OTHR	UPGLAC	
— N 801	GLEN COVE	E 6		53	UNSD	DEST	36			10			NONE	UPGLAC	
— N 802	GLEN COVE	E 6		53	UNSD	DEST	162			8			NONE	UPGLAC	

TABLE 6.--WELL COMPLETION DATA ON SELECTED WELLS AND TEST HOLES IN NORTHERN PART OF TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK.

WELL NUMBER	OWNER OR WELL USER	MAP COORD.	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE SEA LEVEL)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) SEA LEVEL	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY [(GAL/MIN)/FT]
N 803	GLEN COVE	E 6		53	UNSD	DEST	162			8			NONE	UPGLAC	
N 804	GLEN COVE	E 6		53	UNSD	DEST	151			8			NONE	UPGLAC	
N 805	GLEN COVE	E 6		53	UNSD	DEST	120			6			NONE	UPGLAC	
N 806	GLEN COVE	E 6		53	UNSD	DEST	122			6			NONE	UPGLAC	
N 807	GLEN COVE	E 6		53	UNSD	DEST	146			8			NONE	UPGLAC	
N 808	GLEN COVE	E 6		53	UNSD	DEST	55			8			NONE	UPGLAC	
N 809	GLEN COVE	E 6		53	UNSD	DEST	49			8			NONE	UPGLAC	
N 810	GLEN COVE	E 6		53	UNSD	DEST	52	17 TO 1	16	10			NONE	UPGLAC	
N 811	GLEN COVE	E 6		53	UNSD	DEST	42			8			NONE	UPGLAC	
N 811	GLEN COVE	E 6	1951	53	UNSD	DEST	58	11 TO -5	16				NONE	UPGLAC	
N 812	GLEN COVE	E 6		53	UNSD	DEST	52			8			NONE	UPGLAC	
N 813	GLEN COVE	E 6		53	UNSD	DEST	55			8			NONE	UPGLAC	
N 814	GLEN COVE	E 6		53	UNSD	DEST	146			8			NONE	UPGLAC	
N 815	GLEN COVE	E 6		53	UNSD	DEST	161			6			NONE	UPGLAC	
N 816	GLEN COVE	E 6		53	UNSD	DEST	169			6			NONE	UPGLAC	
N 817	GLEN COVE	E 6		53	UNSD	DEST	164			10			NONE	UPGLAC	
N 818	GLEN COVE	E 6		53	UNSD	DEST	159			10			NONE	UPGLAC	
N 834	GLEN COVE	E 6		10	UNSD	UNSD	302	-272 TO -292	20	8			NONE	UPGLAC	
N 835	GLEN COVE	E 6	1931	10	P.S.	WTDR	303	-266 TO -290	24	10				LLOYD	
N 842	SEA CLIFF WATER	E 6	1940	8	UNSD	UNSD	420	-357 TO -407	50	20	FLOWING	07-19-40	NONE	LLOYD	
N 844	L.I.RAILROAD CO	D 7		149	UNSD		258			10			NONE	MAGOTHY	
N 901	SEA CLIFF WATER	E 6	1915	9	UNSD	DEST	84			10			NONE	UPGLAC	
N 901	SEA CLIFF WATER	E 6	1951	9	P.S.	WTDR	68	-37 TO -59	22	8			OTHR	UPGLAC	
N 902	SEA CLIFF WATER	E 6	1921	9	UNSD	DEST	84						NONE	UPGLAC	
N 902	SEA CLIFF WATER	E 6	1946	9	P.S.	WTDR	60			10			OTHR	UPGLAC	
N 903	SEA CLIFF WATER	E 6	1921	9	P.S.	WTDR	184			10			OTHR	UPGLAC	
N 904	SEA CLIFF WATER	E 6	1917	9	UNSD	UNSD	80			10			NONE	UPGLAC	
N 905	SEA CLIFF WATER	E 6	1921	9	UNSD	DEST	80			8			NONE	UPGLAC	
N 905	SEA CLIFF WATER	E 6	1951	9	P.S.	WTDR	67	-37 TO -58	21	8			OTHR	UPGLAC	
N 906	SEA CLIFF WATER	E 6	1927	9	P.S.	WTDR	419						OTHR	LLOYD	
N 907	SEA CLIFF WATER	E 6		9	P.S.	WTDR	134			10			OTHR	PTWCU	
N 908	SEA CLIFF WATER	E 6		9	P.S.	WTDR	293			10			OTHR	PTWCU	
N 909	SEA CLIFF WATER	E 6		9	P.S.	WTDR	196			10			OTHR	PTWCU	
N 1037	SEA CLIFF WATER	E 6	1940	10	P.S.	WTDR	68	-35 TO -55	20	24	8	01-25-40	OTHR	UPGLAC	34
N 1149	NASSAU CO DPW	E 6	1941	89	UNSD	OBS	82			2.50	48.25	09-25-41	NONE	PTWCU	
N 1150	NASSAU CO DPW	E 6	1938	53	UNSD	DEST	21			1.25	15.29	06-09-38	NONE	UPGLAC	
N 1150	NASSAU CO DPW	E 6	1966	56	UNSD	OBS	28	31 TO 28	3	1.25	19.57	05-27-66	TURB	UPGLAC	
N 1151	NASSAU CO DPW	E 6	1938	34	UNSD	DEST	26			1.25	11.89	06-09-38	NONE	UPGLAC	
N 1151	NASSAU CO DPW	E 6	1965	33	UNSD	OBS	23	13 TO 10	3	1.25	10.08	04-09-65	NONE	UPGLAC	
N 1152	NASSAU CO DPW	E 6	1940	154	UNSD	DEST	130			4	102.94	08-06-40	NONE	UPGLAC	

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TABLE 6.--WELL COMPLETION DATA ON SELECTED WELLS AND TEST HOLES IN NORTHERN PART OF TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK.

WELL NUMBER	OWNER OR WELL USER	MAP COORD.	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE SEA LEVEL)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) SEA LEVEL	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY [(GAL/MIN)/FT]
N 1152	NASSAU CO DPW	E 6	1965	154	UNSD	OBS				4	107.74	06-07-65	NONE	UPGLAC	
N 1153	NASSAU CO DPW	E 6	1940	122	UNSD	OBS	86			2.50	59.70	09-09-40	NONE	MAGOTHY	
N 1170	NASSAU CO DPW	E 6	1938	10	UNSD	OBS	49			1.25			NONE	UPGLAC	
N 1170	NASSAU CO DPW	E 6	1976	10	UNSD	OBS	16	-1 TO -6	5	4			NONE	UPGLAC	
N 1171	NASSAU CO DPW	E 6	1938	68	UNSD	DEST	41			1.25			NONE	UPGLAC	
N 1171	NASSAU CO DPW	E 6	1942	83	UNSD	DEST	38			2.50	20.90	09-11-42	NONE	UPGLAC	
N 1172	NASSAU CO DPW	E 6	1940	144	UNSD	OBS	102			2.50	83.35	09-24-40	NONE	UPGLAC	
N 1173	NASSAU CO DPW	E 6	1941	145	UNSD	DEST	97	53 TO 48	5	2.50	78.65	09-11-41	NONE	UPGLAC	
N 1174	NASSAU CO DPW	E 6	1940	113	UNSD	DEST	60			2.50	38.69	09-13-40	NONE	MAGOTHY	
N 1175	NASSAU CO DPW	D 6	1940	177	UNSD	DEST	158			4	92.50	10-24-40	NONE	MAGOTHY	
N 1176	NASSAU CO DPW	D 6	1940	195	UNSD	OBS	198			4	109.28	10-08-40	NONE	MAGOTHY	
N 1187	NASSAU CO DPW	E 7	1938	6	UNSD	DEST	25			1.25			NONE	UPGLAC	
N 1188	NASSAU CO DPW	E 7	1938	37	UNSD	DEST	34			1.25	17.03	07-25-38	NONE	UPGLAC	
N 1188	NASSAU CO DPW	E 7	1961	35	UNSD	OBS	29	9 TO 6	3	1.25	10.20	11-22-61	NONE	UPGLAC	
N 1189	NASSAU CO DPW	E 7	1940	67	UNSD	OBS	33			1.25	12.78	11-26-40	NONE	PTWCU	
N 1190	NASSAU CO DPW	E 7	1940	128	UNSD	OBS	99			4	67.62	11-06-40	NONE	UPGLAC	
N 1191	NASSAU CO DPW	E 7	1940	154	UNSD	DEST	97			2.50	77.76	11-22-40	NONE	UPGLAC	
N 1192	NASSAU CO DPW	D 7	1941	143	UNSD	OBS	78	70 TO 65	5	2.50	55.73	08-11-41	NONE	MAGOTHY	
N 1193	NASSAU CO DPW	D 7	1940	231	UNSD	DEST	161			2.50	141.40	10-18-40	NONE	MAGOTHY	
N 1194	NASSAU CO DPW	D 7	1940	174	UNSD	DEST	104			2.50	85.60	10-31-40	NONE	UPGLAC	
N 1194	NASSAU CO DPW	D 7	1961	168	UNSD	OBS	100			4	79.20	12-14-61	NONE	UPGLAC	
N 1195	NASSAU CO DPW	D 7	1941	147	UNSD	DEST	84	68 TO 63	5	2.50	64.45	09-16-41	NONE	UPGLAC	
N 1195	NASSAU CO DPW	D 7	1961	148	UNSD	TEST	155						NONE		
N 1195	NASSAU CO DPW	D 7	1961	148	UNSD	DEST	77			1.25	61.85	11-30-61	NONE	UPGLAC	
N 1195	NASSAU CO DPW	D 7	1966	148	UNSD	DEST	93			1.25	58.00	11-22-66	NONE	UPGLAC	
N 1195	NASSAU CO DPW	D 7	1976	148	UNSD	OBS	116	37 TO 32	5	4	63.70	08-18-76	NONE	MAGOTHY	
N 1206	NASSAU CO DPW	E 7	1938	9	UNSD	DEST	30			1.25			NONE	UPGLAC	
N 1207	NASSAU CO DPW	E 7	1938	23	UNSD	OBS	24			1.25			NONE	UPGLAC	
N 1208	NASSAU CO DPW	E 7	1938	59	UNSD	DEST	31			1.25	15.21	07-28-38	NONE	UPGLAC	
N 1208	NASSAU CO DPW	E 7	1959	59	UNSD	DEST	31			1.25			NONE	UPGLAC	
N 1208	NASSAU CO DPW	E 7	1963	58	UNSD	OBS	33	28 TO 25	3	1.25	13.45	02-19-63	NONE	UPGLAC	
N 1209	NASSAU CO DPW	E 7	1941	126	UNSD	DEST	68	63 TO 58	5	2.50	49.03	06-10-41	NONE	UPGLAC	
N 1209	NASSAU CO DPW	E 7	1942	126	UNSD	DEST	133			2.50	49.31	11-20-42	NONE	UPGLAC	
N 1209	NASSAU CO DPW	E 7	1943	126	UNSD	DEST	129			2.50	50.20	06-23-43	NONE	UPGLAC	
N 1209	NASSAU CO DPW	E 7	1943	126	UNSD	DEST	174			4	27.44	12-16-42	NONE	UPGLAC	
N 1209	NASSAU CO DPW	E 7	1961	122	UNSD	OBS	64			4	38.07	12-29-61	NONE	UPGLAC	
N 1210	NASSAU CO DPW	E 7	1941	188	UNSD	DEST	108			2.50	96.25	06-24-41	NONE	MAGOTHY	
N 1210	NASSAU CO DPW	E 7	1942	188	UNSD	DEST	140	53 TO 48	5	2.50	93.90	07-30-42	NONE	MAGOTHY	
N 1210	NASSAU CO DPW	E 7	1965	187	UNSD	OBS	143	47 TO 44	3	1.25	98.84	04-06-65	NONE	MAGOTHY	
N 1211	NASSAU CO DPW	D 7	1941	217	UNSD	OBS	156	66 TO 61	5	2.50	141.55	06-03-41	NONE	UPGLAC	

TABLE 6.--WELL COMPLETION DATA ON SELECTED WELLS AND TES[illegible]S IN NORTHERN PART OF TOWN OF OYSTER BAY, NASSAU COUNTY, N[illegible].K.

WELL NUMBER	OWNER OR WELL USER	MAP COORD.	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE SEA LEVEL)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) SEA LEVEL	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY [(GAL/MIN)/FT]
N 1212	NASSAU CO DPW	D 7	1941	227	UNSD	DEST	125			4	96.18	04-25-41	NONE	MAGOTHY	
N 1212	NASSAU CO DPW	D 7	1942	227	UNSD	OBS	185	48 TO 42	6	4	143.48	07-20-42	NONE	MAGOTHY	
N 1213	NASSAU CO DPW	D 7	1941	175	UNSD	DEST	109	71 TO 66	5	2.50	89.98	05-15-41	NONE	UPGLAC	
N 1214	NASSAU CO DPW	D 7	1938	149	UNSD	DEST	80			1.25	68.78	10-13-38	NONE	UPGLAC	
N 1214	NASSAU CO DPW	D 7	1950	149	UNSD	DEST	77			1.25	62.00	02-18-50	NONE	UPGLAC	
N 1214	NASSAU CO DPW	D 7	1965	148	UNSD	OBS	85	66 TO 63	3	1.25	73.14	09-22-65	NONE	UPGLAC	
N 1224	NASSAU CO DPW	E 7	1941	25	UNSD	OBS	39	-10 TO -13	3	1.25	22.37	10-06-41	NONE	UPGLAC	
N 1225	NASSAU CO DPW	E 7	1938	8	UNSD	OBS	20			1.25	5.32	07-29-38	NONE	UPGLAC	
N 1226	NASSAU CO DPW	E 7	1941	34	UNSD	OBS	62	-26 TO -28	2	1.25	9.18	10-09-41	NONE	PTWCU	
N 1227	NASSAU CO DPW	E 8	1941	172	UNSD	OBS	134	43 TO 38	5	2.50	120.17	07-23-41	NONE	MAGOTHY	
N 1228	NASSAU DO DPW	D 8	1941	224	UNSD	DEST	189	41 TO 35	6	4	156.59	03-13-41	NONE	UPGLAC	
N 1228	NASSAU CO DPW	D 8	1941	224	UNSD	DEST	179	51 TO 45	6	4	156.88	09-06-41	NONE	UPGLAC	
N 1228	NASSAU CO DPW	D 8	1962	227	UNSD	OBS	174	54 TO 51	3	4	158.27	02-06-62	NONE	UPGLAC	
N 1229	NASSAU CO DPW	D 8	1941	251	UNSD	OBS	201			4	173.17	01-09-41	NONE	MAGOTHY	
N 1230	NASSAU CO DPW	D 8	1940	174	UNSD	DEST	144			2.50	90.52	12-13-40	NONE	MAGOTHY	
N 1231	NASSAU CO DPW	D 8	1940	143	UNSD	DEST	83			2.50	61.46	11-27-40	NONE	MAGOTHY	
N 1231	NASSAU CO DPW	D 8	1962	139	UNSD	OBS	81			2.50	53.72	03-30-62	NONE	MAGOTHY	
N 1242	NASSAU CO DPW	E 8	1938	41	UNSD	DEST	31			1.25			NONE	UPGLAC	
N 1242	NASSAU CO DPW	E 8	1953	41	UNSD	OBS	32			1.25	14.69	01-05-53	NONE	UPGLAC	
N 1243	NASSAU CO DPW	E 8	1939	65	UNSD	DEST	22			1.25			NONE	UPGLAC	
N 1243	NASSAU CO DPW	E 8	1953	65	UNSD	DEST	24	44 TO 41	3	1.25	7.15	01-07-53	NONE	UPGLAC	
N 1243	NASSAU CO DPW	E 8	1959	67	UNSD	DEST				1.25			NONE	UPGLAC	
N 1243	NASSAU CO DPW	E 8	1966	64	UNSD	DEST	28	39 TO 36	3	1.25	16.00	12-08-66	NONE	MAGOTHY	
N 1243	NASSAU CO DPW	E 8	1975	64	UNSD	OBS	28	39 TO 36	3	1.25	6.44	09-22-75	NONE	MAGOTHY	
N 1244	NASSAU CO DPW	D 8	1940	249	UNSD		262	-9 TO -11	3	4	171.65	04-03-40	NONE	MAGOTHY	
N 1245	NASSAU CO DPW	D 8	1940	260	UNSD	OBS	202			2.50	175.58	01-02-40	NONE	MAGOTHY	
N 1246	NASSAU CO DPW	D 8	1940	186	UNSD	OBS	124			4	102.77	04-30-40	NONE	MAGOTHY	
N 1327	SEA CLIFF WATER	E 6	1940	10	P.S.	WTDR	126	-91 TO -116	25	24	FLOWING	05-22-40	OTHR	UPGLAC	
N 1476	NASSAU CO DPW	E 7	1944	130	UNSD	OBS	83			4			NONE	MAGOTHY	
N 1477	NASSAU CO DPW	E 7	1944	216	UNSD	OBS	194			4			NONE	UPGLAC	
N 1481	NASSAU CO DPW	D 7	1944	149	UNSD	DEST	77			4	67.55	04-18-44	NONE	UPGLAC	
N 1486	J.B.SOLERWITZ	E 8	1927	5	DOM	WTDR	500			8			NONE	LLOYD	
N 1595	SEA CLIFF WATER	E 6	1940	11	P.S.	WTDR	125	-84 TO -114	30	16	2	09-23-40		UPGLAC	15
N 1651	LOCUST VLY WD	E 6	1941	162	P.S.	WTDR	470	-223 TO -303	80	18	145	01-19-41	TURB	LLOYD	24
N 1767	OYSTER BAY	D 8	1941	251	DOM	WTDR	582	-310 TO -331	21	10	180	10-10-41		MAGOTHY	10
N 1768	OYSTER BAY	D 8		250			260			8				MAGOTHY	
N 1773	ST.UNIV.AT O.W.	D 7	1942	228	UNSD	UNSD	293	-53 TO -65	12	8	151	01-14-42	TURB	MAGOTHY	
N 1774	ST.UNIV.AT O.W.	D 7		241	UNSD	UNSD	134			8			NONE	UPGLAC	
N 1775	ST.UNIV.AT O.W.	D 7		188	UNSD	UNSD	286			6			TURB	MAGOTHY	
N 1917	LI TUNGSTEN	E 6	1943	15	IND	WTDR	307	-281 TO -291	10	8			TURB	LLOYD	

TABLE 6.--WELL COMPLETION DATA ON SELECTED WELLS AND TEST HOLES IN NORTHERN PART OF TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK.

WELL NUMBER	OWNER OR WELL USER	MAP COORD.	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE SEA LEVEL)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) SEA LEVEL	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY [(GAL/MIN)/FT]
N 2017	FRIEDMAN	E 7	1945	10	DOM	WTDR	395	-375 TO -384	9	8	FLOWING	04-25-45		LLOYD	
N 2027	SORENSON LUMBER	E 6	1945	21	UNSD	DEST	76	-39 TO -54	15	6	FLOWING	04-10-45	NONE	UPGLAC	12
N 2060	GLEN COVE BOT.	E 6	1946	26	UNSD	UNSD	82	-34 TO -44	10	8	8	06-01-46		UPGLAC	13
N 2072	HICKSVILLE WD	D 7	1946	162	UNSD	DEST	159	24 TO 3	21	10	80	05-15-46	TURB	UPGLAC	28
N 2087	POWERS CHEMCO	E 6	1946	50	UNSD	DEST	75	-9 TO -25	16	8	15	02-25-46	NONE	UPGLAC	2
N 2087	POWERS CHEMCO	E 6	1946	50	IND	WTDR	345	-284 TO -295	11	8	20	07-15-52	TURB	LLOYD	6
N 2088	F.M.GOULD	E 8	1932	159			605			8				LLOYD	
N 2113	G.CARDELLI	E 7	1946	10	DOM	WTDR	449	-417 TO -439	22	8	FLOWING	05-16-46		LLOYD	
N 2132	KOENIG	E 7	1907	10	UNSD	DEST	469			5	FLOWING	00-00-14	NONE	LLOYD	
N 2208	NEW YORK STATE	E 8	1903	15	IND	WTDR	76			6			NONE	UPGLAC	
N 2209	NEW YORK STATE	E 8	1903	15	IND	WTDR	84			6			NONE	UPGLAC	
N 2210	NEW YORK STATE	E 8	1903	15	IND	WTDR	86			5			NONE	UPGLAC	
N 2211	NEW YORK STATE	E 8	1903	15	IND	WTDR	66			6			NONE	UPGLAC	
N 2238	L.I.RAILROAD CO	E 7		10			198			8				PTWCU	
N 2241	BAKER-CAMPBELL	E 7	1947	18	DOM	WTDR	376	-346 TO -358	12	8	+6	10-01-47		LLOYD	25
N 2316	PALL CORP	E 6	1930	157	IND	WTDR	170			6			TURB	UPGLAC	
N 2409	NEW YORK STATE	E 8	1947	15	IND	WTDR	93	-51 TO -71	20	10	FLOWING	09-10-47	NONE	UPGLAC	18
N 2410	NEW YORK STATE	E 8	1947	15	IND	WTDR	90	-50 TO -70	20	10	FLOWING	09-12-47	NONE	UPGLAC	25
N 2528	NASSAU CO DPW	E 7	1946	92	UNSD	TEST	343						NONE		
N 2528	NASSAU CO DPW	E 7	1947	93	UNSD	OBS	328	-185 TO -189	4	6			NONE	UPGLAC	
N 2616	GLEN HEAD CC	E 6	1931	75	IRR	WTDR	232	-109 TO -146	37	12	8	01-30-30	TURB	UPGLAC	59
N 2920	SEL-VRA ACHES	E 8	1948	10	P.S.	WTDR				10				LLOYD	
N 3310	L.I.LIGHTING CO	D 6	1949	27	IND	WTDR	151	-93 TO -124	31	12	4.9	06-27-49	TURB	UPGLAC	43
N 3444	JERICHO WD	D 7	1949	263	UNSD	TEST	460						NONE		
N 3466	GLEN COVE	E 6	1950	53	P.S.	WTDR	177	-95 TO -120	25	12	FLOWING	04-25-50		UPGLAC	9
N 3474	JERICHO WD	D 7	1951	244	P.S.	WTDR	517	-208 TO -268	60	18	153	06-02-50	TURB	MAGOTHY	31
N 3475	JERICHO WD	D 7	1950	208	P.S.	WTDR	487	-224 TO -274	50	18	121	07-22-50	TURB	MAGOTHY	36
N 3486	OYSTER BAY WD	E 7	1950	18	P.S.	WTDR	102	-52 TO -84	32	12				UPGLAC	
N 3561	OYSTER BAY WD	E 7	1950	18	P.S.	WTDR	120	-70 TO -100	30	12	FLOWING	08-31-50		UPGLAC	
N 3569	CERRO WIRE	D 7	1951	181	IND	WTDR	402	-172 TO -221	49	16	95	06-04-51	TURB	MAGOTHY	10
N 3838	SPIEGEL ASSOC.	D 7	1951	195	UNSD	DEST	163	42 TO 32	10	8	105	12-03-51	NONE	MAGOTHY	4
N 3850	FAIRCHILD CORP	D 7		185	UNSD	TEST	501						NONE		
N 3850	FAIRCHILD CORP	D 7	1953	185	UNSD	UNSD	445	-215 TO -255	40	16	104	02-08-52	TURB	MAGOTHY	39
N 3860	FAIRCHILD CORP	D 7	1953	183	UNSD	UNSD	445	-217 TO -257	40	16	101	03-25-52	SUBM	MAGOTHY	43
N 3874	FAIRCHILD CORP	D 7	1952	183	UNSD	UNSD	335	-127 TO -147	20	16	106	11-06-52	TURB	MAGOTHY	8
N 3877	HICKSVILLE WD	D 7	1952	152	UNSD	TEST	555						NONE		
N 3878	HICKSVILLE WD	D 7	1952	150	UNSD	TEST	606						NONE		
N 3878	HICKSVILLE WD	D 7	1952	150	P.S.	WTDR	428	-225 TO -278	53	18	67	07-22-52	TURB	MAGOTHY	53
N 3892	GLEN COVE	E 6	1953	145	UNSD	TEST	445						NONE		
N 3892	GLEN COVE	E 6	1953	145	P.S.	WTDR	251	6 TO -101	54	16	87	10-07-53		UPGLAC	40

TABLE 6.--WELL COMPLETION DATA ON SELECTED WELLS AND TEST S IN NORTHERN PART OF TOWN OF OYSTER BAY, NASSAU COUNTY, NEW K.

WELL NUMBER	OWNER OR WELL USER	MAP COORD.	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE SEA LEVEL)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) SEA LEVEL	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY [(GAL/MIN)/FT]
N 3925	COCA COLA CO	D 7	1952	158	UNSD	UNSD	143	36 TO 15	21	8	63	08-14-52	TURB	UPGLAC	
N 3953	HICKSVILLE WD	D 7	1952	152	UNSD	TEST	514						NONE		
N 3953	HICKSVILLE WD	D 7	1953	152	P.S.	WTDR	419	-17 TO -267	92	18	66	11-14-52	TURB	MAGOTHY	69
N 3982	A.DAVIS	E 7	1952	20	DOM	WTDR	419	-376 TO -399	23	6	FLOWING	10-07-52	TURB	LLOYD	
N 4058	CERTIFIED IND	E 7	1952	75	UNSD	DEST	200						NONE	MAGOTHY	
N 4095	PLAINVIEW WD	D 8	1954	150	P.S.	WTDR	495	-290 TO -340	50	18	72	08-03-54	TURB	MAGOTHY	31
N 4096	PLAINVIEW WD	D 8	1954	150	P.S.	WTDR	499	-294 TO -344	50	18	68	08-02-54	TURB	MAGOTHY	37
N 4097	PLAINVIEW WD	D 8	1954	158	P.S.	WTDR	470	-255 TO -305	50	18	75	08-04-54	TURB	MAGOTHY	36
N 4133	JERICHO WD	D 7	1954	192	P.S.	WTDR	445	-208 TO -258	50	18	102	05-28-54	TURB	MAGOTHY	17
N 4136	OYSTER BAY WD	E 7	1953	18	UNSD	UNSD	310						NONE	PTWAQ	
N 4137	OYSTER BAY WD	E 7	1953	18	UNSD	UNSD	188	-145 TO -170	25	12	FLOWING	04-28-53	NONE	PTWCU	
N 4245	JERICHO WD	D 7	1955	222	P.S.	WTDR	571	-303 TO -343	40	18	150	11-12-53	TURB	MAGOTHY	30
N 4246	JERICHO WD	D 7	1954	200	UNSD	UNSD	458	-203 TO -253	50	18	110	11-05-54	TURB	MAGOTHY	31
N 4376	MARY G.BURKE	E 7	1953	58	DOM	WTDR	367	-298 TO -308	10	6	50	12-07-53	TURB	LLOYD	15
N 4400	OYSTER BAY WD	E 8	1954	36	UNSD	TEST	400						NONE		
N 4400	OYSTER BAY WD	E 8	1957	36	P.S.	WTDR	302	-178 TO -266	88	20	2	09-04-56	TURB	MAGOTHY	50
N 4431	CERTIFIED IND	D 7	1953	98	UNSD	DEST	30	79 TO 68	11	4	4	06-00-53	NONE	UPGLAC	11
N 4432	DYCKMAN LAUNDRY	E 6	1955	28	COM	WTDR	352	-304 TO -320	16	6	FLOWING	04-00-55	TURB	LLOYD	2
N 4440	F.MARMORALE	E 7	1954	16	DOM	WTDR	316	-290 TO -300	10	6	0	07-16-54		LLOYD	10
N 4462	NORTH SHORE CC	E 6	1954	69	UNSD	TEST	271						NONE		
N 4462	NORTH SHORE CC	E 6	1954	69	IRR	WTDR	181	-80 TO -112	32	12	46	05-25-54	TURB	PTWCU	10
N 4633	MEADOWBROOK CL	D 7		176	UNSD	TEST	308						NONE		
N 4633	MEADOWBROOK CL	D 7	1954	176	IRR	WTDR	216	13 TO -39	52	16	94	08-25-54	TURB	MAGOTHY	83
N 4639	NASSAU CC	E 6	1911	123		WTDR	250			10				MAGOTHY	
N 4760	PINE HOLLOW CC	E 7	1954	220	IRR	WTDR	247	5 TO -27	32	12	172	09-15-54	TURB	UPGLAC	51
N 4891	PINE HOLLOW CC	E 7	1933	230	UNSD	UNSD	245			10	183	05-00-33	TURB	UPGLAC	9
N 5058	WM.J.LEVITT	D 7	1955	238	UNSD	UNSD	255	3 TO -17	20	8	151	11-17-54	TURB	MAGOTHY	25
N 5071	NASSAU CC	E 6	1954	143	IRR	WTDR	242	-67 TO -99	32	12	90	10-26-54	TURB	MAGOTHY	29
N 5086	S.L.LANG	D 7	1955	225	UNSD	DEST	193	36 TO 32	4	4	170	00-00-55	NONE	MAGOTHY	
N 5152	LOCUST VLY WD	E 6	1956	44	P.S.	WTDR	360	-261 TO -311	50	18	18	08-10-56	TURB	PTWAQ	11
N 5188	P.SAMRAD	E 7	1955	22	DOM	WTDR	375	-340 TO -350	10	6			TURB	LLOYD	3
N 5201	JERICHO WD	D 6	1956	48	P.S.	WTDR	509	-386 TO -456	70	18	36	06-12-56	TURB	LLOYD	27
N 5250	NASSAU CO DPW	E 6	1944	128	UNSD	DEST	89			2.50	71.48	06-23-44	NONE	UPGLAC	
N 5250	NASSAU CO DPW	E 6	1967	123	UNSD	OBS	101			1.25	79.80	01-24-67	NONE	UPGLAC	
N 5261	GLEN COVE	E 6	1955	145	UNSD	TEST	302						NONE		
N 5261	GLEN COVE	E 6	1955	145	P.S.	WTDR	235	14 TO -85	59	18	97	05-14-55	SUBM	PTWCU	43
N 5332	CERTIFIED IND	E 7	1955	73	UNSD	DEST	162	-44 TO -89	45	12	28	11-26-55	NONE	UPGLAC	34
N 5335	CERT.REDI MIX	D 7	1955	170	UNSD	DEST	144	47 TO 26	21	6	80	00-00-55	NONE	MAGOTHY	
N 5450	ENGINEERS CC	D 6	1955	57	IRR	WTDR	80	-1 TO -23	22	12	7.5	06-29-55	TURB	UPGLAC	15
N 5672	BEAVER DAM CLUB	E 7	1955	25	COM	WTDR	121	-76 TO -96	20	8	FLOWING	12-06-55	TURB	UPGLAC	

TABLE 6.--WELL COMPLETION DATA ON SELECTED WELLS AND TEST HOLES IN NORTHERN PART OF TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK.

WELL NUMBER	OWNER OR WELL USER	MAP COORD.	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE SEA LEVEL)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) SEA LEVEL	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY [(GAL/MIN)/FT]
N 5677	KOLLSMAN INST.	D 7	1955	218	UNSD	TEST	429						NONE		
N 5677	KOLLSMAN INST.	D 7	1956	218		WTDR	257	47 TO -39	60	12	130	06-22-56	TURB	MAGOTHY	44
N 5762	GLEN COVE	E 6	1956	145	UNSD	TEST	310						NONE		
N 5762	GLEN COVE	E 6	1956	145	P.S.	WTDR	283	-76 TO -135	59	18	81	07-05-56	SUBM	MAGOTHY	58
N 5792	SEA CLIFF WATER	E 6	1956	140	UNSD	TEST	361						NONE		
N 5792	SEA CLIFF WATER	E 6	1957	140	P.S.	WTDR	300	-115 TO -155	40	20	84.4	11-07-57	TURB	UPGLAC	175
N 5851	ST.UNIV.AT O.W.	D 7	1956	218	DOM	WTDR	177	47 TO 41	6	6	128	08-31-56	SUBM	MAGOTHY	2
N 5901	CERT.REDI-MIX	D 7	1956	179	UNSD	DEST	148	42 TO 31	11	4	90	06-02-56	NONE	MAGOTHY	
N 5994	GLEN COVE HOSP	E 6	1957	130	INST	WTDR	226	-43 TO -96	36	16	73	08-22-56	TURB	MAGOTHY	43
N 6042	MILL NECK ESTS.	E 7		10	P.S.	WTDR	347	-318 TO -330	12	8				PTWAQ	
N 6076	PLAINVIEW WD	D 8	1956	158	UNSD	TEST	694						NONE		
N 6076	PLAINVIEW WD	D 8	1957	158	P.S.	WTDR	358	-138 TO -200	62	20	73	02-11-57	TURB	MAGOTHY	41
N 6077	PLAINVIEW WD	D 8	1956	158	UNSD	TEST	692						NONE		
N 6077	PLAINVIEW WD	D 8	1957	158	P.S.	WTDR	465	-240 TO -302	62	20	75	03-06-57	TURB	MAGOTHY	45
N 6092	JERICHO WD	D 8	1958	241	P.S.	WTDR	637	-320 TO -390	70	18	184	06-25-57	TURB	MAGOTHY	52
N 6093	JERICHO WD	D 8	1957	259	P.S.	WTDR	612	-287 TO -347	60	18	171	09-09-57	TURB	MAGOTHY	54
N 6190	HICKSVILLE WD	D 7	1957	177	UNSD	TEST	542						NONE		
N 6190	HICKSVILLE WD	D 7	1958	177	P.S.	WTDR	605	-373 TO -423	50	20	94	08-22-57	TURB	MAGOTHY	41
N 6191	HICKSVILLE WD	D 7	1957	176	UNSD	TEST	676						NONE		
N 6191	HICKSVILLE WD	D 7	1958	176	P.S.	WTDR	555	-313 TO -374	61	20	93.5	06-26-57	TURB	MAGOTHY	37
N 6289	PIPING ROCK CL	E 6	1957	162	UNSD	TEST	385						NONE		
N 6289	PIPING ROCK CL	E 6	1957	162	IRR	WTDR	219	40 TO -57	37	12	71	09-19-57	TURB	UPGLAC	19
N 6294	U.S. GEOL SURV	E 7	1957	93	UNSD	DEST	28			1.25	22.81	06-17-57	TURB	UPGLAC	
N 6294	U.S. GEOL SURV	E 7	1966	93	UNSD		37			1.25			NONE	UPGLAC	
N 6416	ZARA ASPHALT CO	E 6	1958	15	UNSD	TEST	295						NONE		
N 6416	ZARA ASPHALT CO	E 6	1958	15	UNSD	UNSD	107	-83 TO -92	9	6	6.5	06-06-58	TURB	UPGLAC	1
N 6435	LAVISTA	E 7	1958	58	DOM	WTDR	439	-360 TO -380	15	6	38.5	06-00-58	SUBM	LLOYD	
N 6444	BROOKVILLE CC	E 6	1958	170	IRR	WTDR	257	-51 TO -87	36	12	75	06-30-58	TURB	MAGOTHY	37
N 6531	RIVERSIDE PLAS.	D 7	1959	178	UNSD	DEST	119	64 TO 59	5	6	89	09-25-58	NONE	UPGLAC	8
N 6531	METCO INC	D 7	1966	178	IRR	WTDR	174	17 TO 5	12	6	102	05-05-66	SUBM	UPGLAC	10
N 6549	POWERS CHEMCO	E 6	1958	32	IND	RECH	425	-292 TO -393	60	8	20	08-13-58	NONE	LLOYD	14
N 6579	GLEN COMPONENTS	E 6	1958	57		WTDR	146	-73 TO -89	16	4			TURB	UPGLAC	
N 6580	PLAINVIEW WD	D 8	1958	158	UNSD	TEST	702				75	08-13-58	TURB		
N 6580	PLAINVIEW WD	D 8	1958	158	P.S.	WTDR	601	-365 TO -438	63	20	75	08-13-58	TURB	MAGOTHY	54
N 6587	ZARA ASPHALT	E 6	1958	15	UNSD	UNSD	56	-25 TO -41	16	6	7	06-06-58	TURB	UPGLAC	
N 6651	JERICHO WD	D 7	1960	232	P.S.	WTDR	615	-328 TO -378	50	18	133.7	05-17-60	TURB	MAGOTHY	27
N 6655	METCO INC	D 7	1959	122	UNSD	UNSD	236	-74 TO -114	40	8	47	04-24-59	NONE	MAGOTHY	15
N 6665	U.S. GEOL SURV	D 6	1959	97	UNSD		29	70 TO 68	2	1.25			NONE	UPGLAC	
N 6666	U.S. GEOL SURV	D 6	1959	97	UNSD		12			1.25			NONE	UPGLAC	
N 6667	U.S. GEOL SURV	D 6	1959	94	UNSD		43	53 TO 51	2	1.25			NONE	UPGLAC	

TABLE 6.--WELL COMPLETION DATA ON SELECTED WELLS AND TEST HOLES IN NORTHERN PART OF TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK.

WELL NUMBER	OWNER OR WELL USER	MAP COORD.	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE SEA LEVEL)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) SEA LEVEL	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY [(GAL/MIN)/FT]
N 6668	U.S. GEOL SURV	E 6	1959	103	UNSD	OBS	43			1.25			NONE	UPGLAC	
N 6669	U.S. GEOL SURV	E 6	1959	89	UNSD	OBS	44			1.25			NONE	UPGLAC	
N 6670	U.S. GEOL SURV	E 6	1959	81	UNSD	OBS	13			1.25			NONE	UPGLAC	
N 6675	PAR ARNEBERG	E 7	1959	7	DOM	WTDR	460	-448 TO -453	5				SUBM	LLOYD	
N 6708	ZARA ASPHALT CO	E 6	1959	13	UNSD	OBS	50	-33 TO -37	4	4	5.5	06-00-59	NONE	UPGLAC	
N 6741	CERRO WIRE	D 7	1959	181	IND	WTDR	423	-192 TO -242	50	18	102	09-04-59	TURB	MAGOTHY	35
N 6768	L.I. STATE PARK	E 7	1914	208	INST	WTDR	175	45 TO 33	12	8				MAGOTHY	
N 6806	CEDAR BROOK CC	E 6	1960	154	IRR	WTDR	323	-133 TO -163	30	12	86	02-18-60	TURB	MAGOTHY	33
N 6860	GENERAL INST.	D 7	1960	138	UNSD	DEST	96	52 TO 42	10	8	57	04-04-60	NONE	UPGLAC	10
N 6876	U.S. GEOL SURV	E 8	1960	146	UNSD	TEST	113						NONE		
N 6877	U.S. GEOL SURV	E 7	1960	130	UNSD	TEST	133						NONE		
N 6878	U.S. GEOL SURV	E 7	1960	35	UNSD		23	15 TO 12	3	1.25			NONE	UPGLAC	
N 6879	U.S. GEOL SURV	E 7		131	UNSD	OBS	131	2 TO 0	2	1.25			NONE	MAGOTHY	
N 6880	U.S. GEOL SURV	E 7	1960	115	UNSD	TEST	133						NONE		
N 6881	U.S. GEOL SURV	D 6		94	UNSD		75	22 TO 19	3	1.25			NONE	UPGLAC	
N 6882	U.S. GEOL SURV	D 6	1960	140	UNSD		77	66 TO 63	3	1.25			NONE	UPGLAC	
N 6883	U.S. GEOL SURV	D 6	1960	118	UNSD		82	39 TO 36	3	1.25			NONE	UPGLAC	
N 6884	U.S. GEOL SURV	E 7	1960	191	UNSD		108	86 TO 83	3	1.25			NONE	UPGLAC	
N 6885	U.S. GEOL SURV	E 7	1960	165	UNSD		114	54 TO 51	3	1.25			NONE	UPGLAC	
N 6886	U.S. GEOL SURV	E 7	1960	164	UNSD		98	69 TO 66	3	1.25			NONE	UPGLAC	
N 6887	U.S. GEOL SURV	F 8	1960	160	UNSD		90	73 TO 70	3	1.25			NONE	UPGLAC	
N 6888	U.S. GEOL SURV	E 8	1960	86	UNSD		56	33 TO 30	3	1.25			NONE	MAGOTHY	
N 6889	U.S. GEOL SURV	D 8	1960	290	UNSD	TEST	135						NONE		
N 6973	NASSAU CO DPW	D 7	1960	48	UNSD	DEST	34	17 TO 14	3	1.25	8.23	08-02-60	NONE	UPGLAC	
N 7030	JERICHO WD	D 7	1962	158	P.S.	WTDR	531	-322 TO -372	50	20	75	04-23-62	TURB	MAGOTHY	10
N 7034	WOODCREST CLUB	D 7	1961	219	IRR	WTDR	232	18 TO -13	31	12	145	03-16-61	TURB	UPGLAC	42
N 7045	ST.UNIV.AT O.W.	D 7	1961	241	UNSD	UNSD	151	105 TO 90	15	8	143	05-21-61	TURB	MAGOTHY	
N 7047	L.I. STATE PARK	E 7	1962	223	INST	WTDR	264	11 TO -41	52	12	169	06-09-61	SUBM	MAGOTHY	39
N 7066	MEYER GOLDSTEIN	E 7	1961	9	UNSD	UNSD	89	-65 TO -80	15	6	2	05-15-61	SUBM	PTWCU	7
N 7115	MUTTONTOWN CC	E 7	1961	205	IRR	WTDR	274	-29 TO -69	40	12			TURB	MAGOTHY	
N 7152	U.S. GEOL SURV	E 7	1961	14	UNSD	OBS	370	-346 TO -356	10	6	6	08-17-61	NONE	LLOYD	
N 7190	U.S. GEOL SURV	E 7	1961	14	UNSD	OBS	240	-223 TO -226	3	2	8.24	09-07-61	NONE	PTWAQ	
N 7191	U.S. GEOL SURV	E 7	1961	14	UNSD	OBS	142	-125 TO -128	3	2	3.94	09-07-61	NONE	PTWCU	
N 7192	U.S. GEOL SURV	E 7	1961	14	UNSD	OBS	40	-23 TO -26	3	2	14.31	09-07-61	NONE	UPGLAC	
N 7193	U.S. GEOL SURV	E 7	1961	14	UNSD	UNSD	18	-1 TO -4	3	1.25	10.88	09-07-61	NONE	UPGLAC	
N 7277	CERTIFIED IND	E 7	1962	77	UNSD	UNSD	235	-122 TO -157	35	12			NONE	UPGLAC	
N 7419	OYSTER BAY	D 8	1963	243	UNSD	UNSD	325	-57 TO -82	25	10	173	08-14-63	SUBM	MAGOTHY	9
N 7420	AM.PHYSICS INST	D 8	1963	283	COM	WTDR	265	33 TO 18	15	6	211	10-09-63	SUBM	MAGOTHY	4
N 7427	PHOTOCIRCUITS	E 6	1963	58	IND	WTDR	161	-62 TO -103	41	12	3	05-13-63	TURB	UPGLAC	57
N 7439	[illegible] COVE	E 6	1963	22		WTDR	212	-182 TO -188	6	4			SUBM	LLOYD	

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N 7446	JERICHO WD	D 7	1964	222	P.S.	WTDR	498	-221 TO -271	50	20	146	05-26-64	TURB	MAGOTHY	30
N 7450	NASSAU CO DPW	D 6	1975	176	UNSD	OBS	134	47 TO 42	5	4			NONE	MAGOTHY	
N 7478	NASSAU CO DPW	D 7	1963	217	UNSD	OBS	165			4	131.40	07-18-63	NONE	MAGOTHY	
N 7510	F.F.PASSARELLA	E 7	1964	19	DOM	WTDR	329	-302 TO -310	8	8	12	04-21-64	SUBM	LLOYD	2
N 7526	PLAINVIEW WD	D 8	1964	228	P.S.	WTDR	691	-342 TO -460	73	20	140	08-03-64	SUBM	MAGOTHY	63
N 7546	NASSAU CO DPW	E 7	1964	11	UNSD	OBS	364	-348 TO -353	5	4			NONE	LLOYD	
N 7547	NASSAU CO DPW	E 6	1966	9	UNSD	TEST	322			6			NONE		
N 7549	OLD WESTBURY	D 6	1965	198	P.S.	WTDR	504	-251 TO -301	50	20	126	06-03-65	TURB	MAGOTHY	22
N 7562	HICKSVILLE WD	D 7	1964	163	P.S.	WTDR	550			20	80	06-01-64	TURB	MAGOTHY	28
N 7570	BAYVILLE	E 7	1964	125	UNSD	TEST	522						NONE		
N 7593	JERICHO WD	E 8	1965	253	P.S.	WTDR	473	-155 TO -215	60	20	205	05-24-65	TURB	MAGOTHY	40
N 7614	POWERS CHEMCO	E 6	1964	32	IND	WTDR	393	-319 TO -360	41	10	32	08-28-64	TURB	LLOYD	9
N 7620	BAYVILLE	E 7	1964	125	P.S.	WTDR	480	-287 TO -355	68	16	113.36	09-09-64	TURB	LLOYD	19
N 7643	BAYVILLE	E 7	1964	125	P.S.	WTDR	218	-34 TO -93	59	20	121.6	09-18-64	TURB	UPGLAC	169
N 7644	J.D.MOONEY	E 7	1964	19	DOM	WTDR	320	-286 TO -301	15	4	13	09-04-64	SUBM	LLOYD	5
N 7664	ENGINEERS CC	D 6	1965	53	IRR	WTDR	85	-5 TO -26	21	12			TURB	UPGLAC	22
N 7665	LOCUST VLY WD	E 6	1966	218	P.S.	WTDR	375	-102 TO -152	50	20	172	12-11-65	TURB	UPGLAC	30
N 7672	NASSAU CO DPW	D 7	1964	177	UNSD	OBS	159	20 TO 18	2	2	90.00	11-02-64	NONE	MAGOTHY	
N 7719	BAYVILLE	E 7	1964	20	UNSD	OBS	400	-378 TO -380	2	4			NONE	BEDROCK	
N 7745	W.J.LEVITT	E 7	1965	150	DOM	WTDR	215	-40 TO -65	25	16	105	02-24-65	TURB	PTWCU	6
N 7772	JERICHO WD	E 7	1966	258	P.S.	WTDR	568	-245 TO -305	60	20	194	05-19-66	TURB	MAGOTHY	23
N 7773	JERICHO WD	E 7	1966	230	P.S.	WTDR	565	-270 TO -330	60	20	188	05-24-66	TURB	MAGOTHY	30
N 7781	JERICHO WD	D 7	1965	217	P.S.	WTDR	459	-177 TO -237	60	20	140	06-29-65	TURB	MAGOTHY	42
N 7782	ST. PATRICKS	E 6	1965	95	ARCD	WTDR	226	-105 TO -131	26	8	40.2	03-14-65	TURB	MAGOTHY	
N 7830	MILL RIVER CLUB	E 7	1965	118	IRR	WTDR	197	-48 TO -79	31	12	67	05-05-65	TURB	MAGOTHY	33
N 7834	GLEN HEAD CC	E 6	1965	150	IRR	WTDR	202	-21 TO -52	31	12	116	05-25-65	TURB	UPGLAC	27
CLOSEST WELL N 7857	SEA CLIFF WATER	E 6	1966	195	P.S.	WTDR	614	-365 TO -419	54	20	195	05-10-66	SUBM	LLOYD	13
N 7858	TAM OSHANTER CC	D 7	1966	218	IRR	WTDR	375	-92 TO -142	50	16	140	03-01-66	TURB	MAGOTHY	80
N 8043	JERICHO WD	D 8	1966	222	P.S.	WTDR	688	-293 TO -466	173	20	153	06-10-66	TURB	MAGOTHY	68
N 8048	POWERS CHEMCO	E 6	1966	60		RECH	370	-260 TO -310	44	12			NONE	LLOYD	
N 8123	WINSTON GUEST	E 7	1966	263	OTHR	WTDR	326	-56 TO -63	7	6	215	09-00-66	SUBM	MAGOTHY	
N 8183	OYSTER BAY WD	E 7	1966	90	UNSD	TEST	487						NONE		
N 8183	OYSTER BAY WD	E 7	1968	90	P.S.	WTDR	230	-91 TO -140	49	16	54.5	11-17-67	TURB	UPGLAC	30
N 8224	PHOTOCIRUITS	E 6	1970	58	IND	WTDR	155	-46 TO -97	51	12	11.5	01-29-70	TURB	UPGLAC	254
N 8249	HICKSVILLE WD	D 7	1967	163	P.S.	WTDR	495	-237 TO -327	90	20	89	02-25-67	SUBM	MAGOTHY	71
N 8259	NASSAU CO DPW	E 6	1967	70	UNSD	OBS	42	30 TO 28	2	1.25	35.50	01-17-67	NONE	UPGLAC	
N 8326	GLEN COVE	E 6	1967	53	UNSD	TEST	507						NONE		
N 8326	GLEN COVE	E 6	1965	53	P.S.	WTDR	168	-67 TO -112	45	20	6.5	07-26-67	SUBM	UPGLAC	33
N 8327	GLEN COVE	E 6	1967	53	UNSD	TEST	362						NONE		
N 8327	GLEN COVE	E 6	1965	53	P.S.	WTDR	168	-65 TO -115	50	20	13.5	09-06-67	SUBM	UPGLAC	41

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N 8355	JERICHO WD	D 7	1969	258	P.S.	WTDR	595	-272 TO -332	60	20	194	04-25-69	TURB	MAGOTHY	42
N 8394	GLEN COVE HOSP.	E 6	1969	138		RECH	580	-379 TO -442	63	8			NONE	LLOYD	
N 8426	MILL NECK ESTS.	E 7	1968	10	P.S.	WTDR	360	-335 TO -350	15	8	FLOWING	05-20-68	SUBM	PTWAQ	3
N 8430	NASSAU CO DPW	E 7	1968	190	UNSD	OBS	145	50 TO 45	5	4	133.17	04-10-68	NONE	MAGOTHY	
N 8432	C.W.POST COLL.	D 6	1968	165	IRR	WTDR	250	-55 TO -85	30	10	107	05-07-68	SUBM	MAGOTHY	26
N 8492	MRS.G.PELLICORO	D 7	1969	178	DOM	WTDR	150	34 TO 29	5	6			SUBM	UPGLAC	
N 8493	J.GIANETTO	D 7	1968	175	DOM	WTDR	255	-75 TO -80	5	6			SUBM	MAGOTHY	
N 8542	MUTTONTOWN CC	E 7	1969	175	IRR	WTDR	335	-119 TO -160	41	12	116	04-30-69	SUBM	UPGLAC	24
N 8583	NASSAU CO DPW	D 8	1969	194	UNSD		177	22 TO 17	5	4			NONE	MAGOTHY	
N 8597	G.VAN AKEN	E 8	1969	100	DOM	WTDR	228	-116 TO -126	10	6			SUBM	UPGLAC	
N 8606	NASSAU CO DPW	D 8	1969	197	UNSD		80	121 TO 117	4	2	71.60	08-20-69	NONE	UPGLAC	
N 8610	NASSAU CO DPW	E 6	1969	8	UNSD	OBS	22	-12 TO -14	2	1.25	8.27	08-06-69	NONE	UPGLAC	
N 8642	GLEN OAKES CC	D 7	1970	243	IRR	WTDR	400	-126 TO -157	31	12	185	05-14-70	SUBM	MAGOTHY	27
N 8658	OLD WESTBURY	D 7	1970	325	UNSD	TEST	670						NONE		
N 8658	OLD WESTBURY	D 7	1972	320	P.S.	WTDR	615	-230 TO -290	60	20	248.4	03-30-72	TURB	MAGOTHY	49
N 8681	FOX RUN CC	E 7	1970	200	IRR	WTDR	370	-117 TO -169	52	12	133	08-12-70		MAGOTHY	32
N 8690	FABRIC LEATHER	E 6	1970	25		WTDR	347	-292 TO -317	25	8				LLOYD	
N 8709	FABRIC LEATHER	E 6	1970	22	IND	RECH	312	-218 TO -290	72	6	8	10-07-70	NONE	LLOYD	
N 8713	JERICHO WD	D 6	1970	168	UNSD	TEST	412						NONE		
N 8713	JERICHO WD	D 6	1972	168	P.S.	WTDR	377	-144 TO -204	60	20	113.1	03-23-72	TURB	MAGOTHY	51
N 8716	NASSAU CO DPW	E 6	1970	47	UNSD	OBS	25			1.25	7.60	09-29-70	NONE	UPGLAC	
N 8776	BAYVILLE	E 7	1972	98	P.S.	WTDR	459	-301 TO -361	60	20	106.3	06-24-71	TURB	LLOYD	29
N 8805	G.E.RODUIT	E 7	1971	63	DOM	WTDR	457	-384 TO -394	10	5	53.5	09-10-71	SUBM	LLOYD	6
N 8807	CERTIFIED IND	D 7	1971	118	IND	WTDR	140	9 TO -22	31	8	17	10-25-71	TURB	MAGOTHY	9
N 8880	METCO INC	D 7	1972	122	IND	WTDR	247	-99 TO -125	26	8	51	10-03-72	SUBM	MAGOTHY	19
N 8887	SLATER ELECTRIC	E 6	1972	65	IND	WTDR	130	-40 TO -65	25	8	12	10-17-72	SUBM	UPGLAC	6
N 8888	NASSAU CO DPW	D 7	1972	174	UNSD	OBS	111	68 TO 63	5	4	91.38	10-25-72	NONE	UPGLAC	
N 8898	L.I.LIGHTING CO	D 6	1973	18	UNSD	TEST	223						NONE		
N 8928	NASSAU CO DPW	E 7	1973	10	UNSD	OBS	31	-18 TO -21	3	1.25	8.06	01-18-73	NONE	UPGLAC	
N 8937	L.I.LIGHTING CO	D 6	1973	18	COM	WTDR	164	-103 TO -143	40	12	3	10-10-73	TURB	UPGLAC	24
N 8962	MRS.S.PRATT	E 6	1973	6	DOM	WTDR	420	-365 TO -414	41	4				LLOYD	
N 8995	THURSTON SMITH	E 7	1974	41	DOM	WTDR	405	-354 TO -364	10	6			SUBM	LLOYD	
N 9023	PINE HOLLOW CC	E 7	1974	219	IRR	WTDR	247	2 TO -28	30	12	175	07-09-74	TURB	UPGLAC	50
N 9059	NASSAU CO DPW	D 7	1974	228	UNSD	OBS	175	58 TO 53	5	4	117.90	10-31-74	NONE	MAGOTHY	
N 9066	GLEN COVE	E 6	1975	143	UNSD	TEST	651						NONE		
N 9066	GLEN COVE	E 6	1975	143	UNSD	TEST	460	-277 TO -317	40					LLOYD	
N 9066	GLEN COVE	E 6	1975	143	UNSD	OBS	270	-77 TO -127	50	12	92	09-00-75		MAGOTHY	
N 9068	NATL. PARK SERV	E 8		154		WTDR	325			6				PTWCU	
N 9076	NATL. PARK SERV	E 8	1975	154		WTDR	199	-35 TO -45	10	8				PTWCU	
N 9087	NASSAU CO DPW	E 7	1975	157	UNSD	OBS	111	51 TO 46	5	4	93.60	08-08-75	NONE	UPGLAC	

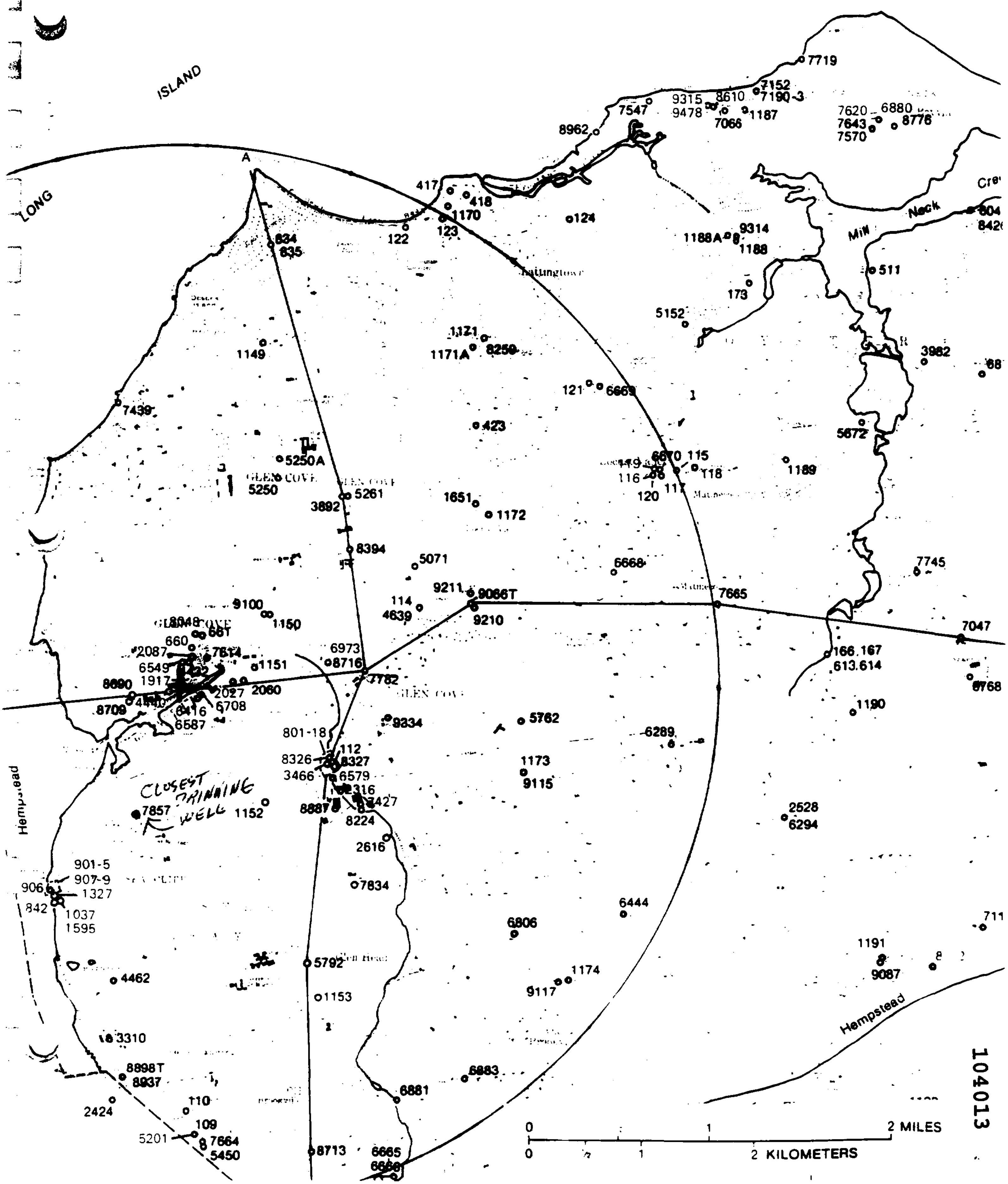
104011

TABLE 6.--WELL COMPLETION DATA ON SELECTED WELLS AND TEST HOLES IN NORTHERN PART OF TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK.

WELL NUMBER	OWNER OR WELL USER	MAP COORD.	YEAR COMP-LETED	ALTITUDE OF LSD (FT ABOVE SEA LEVEL)	USE OF WATER	USE OF WELL	DEPTH OF WELL (FT)	SCREEN SETTING (FT ABOVE OR BELOW (-) SEA LEVEL	TOTAL SCREEN LENGTH (FT)	DIAM OF WELL (IN)	WATER LEVEL (FT BELOW LSD)	DATE OF MEAS. (M-D-Y)	LIFT TYPE	AQUIFER DEVEL-OPED	SPECIFIC CAPACITY [(GAL/MIN)/FT]
N 9089	NASSAU CO DPW	D 8	1975	173	UNSD	OBS	178	0 TO -5	5	4	93.20	11-19-75	NONE	MAGOTHY	
N 9100	NASSAU CO DPW	E 6	1976	54	UNSD	OBS	70	-11 TO -16	5	4	13.85	02-27-76	NONE	PTWCU	
N 9115	NASSAU CO DPW	E 6	1976	145	UNSD	OBS	110	40 TO 35	5	4			NONE	MAGOTHY	
N 9117	NASSAU CO DPW	E 6	1976	112	UNSD	OBS	73	44 TO 39	5	4	40.73	04-05-76	NONE	MAGOTHY	
N 9127	NASSAU CO DPW	E 7	1976	10	UNSD	OBS	41	-26 TO -31	5	4	6.32	07-09-76	NONE	UPGLAC	
N 9152	NASSAU CO DPW	E 8	1976	40	UNSD	OBS	58	-13 TO -18	5	4			NONE	UPGLAC	
N 9154	NASSAU CO DPW	E 7	1976	34	UNSD	OBS	66	-27 TO -32	5	4			NONE	PTWCU	
N 9170	REG.PLAN.BOARD	D 7	1977	184	UNSD	TEST	553						NONE		
N 9170	REG.PLAN.BOARD	D 7	1977	184	UNSD	OBS	510	-321 TO -326	5	1.25	95.5	01-00-77	NONE	MAGOTHY	
N 9189	NASSAU CO CPW	E 7	1977	59	UNSD	OBS	42	22 TO 17	5	4	13.05	03-02-77	NONE	UPGLAC	
N 9210	GLEN COVE	E 6	1979	142	P.S.	WTDR	275	-67 TO -128	61	20	99.2	08-19-77		MAGOTHY	
N 9211	GLEN COVE	E 6	1979	142	P.S.	WTDR	269	-60 TO -122	62	20			TURB	MAGOTHY	34
N 9259	HENRY R. STERN	E 7	1977	58	IRR	UNSD	5 10		3 1	0	55.5	09-02-77	SUBM	UPGLAC	15
N 9276	D.HOLTERBOSCH	E 7	1978	10	UNSD	TEST	321						NONE		
N 9300	NASSAU CO WTR	E 7		45	UNSD	DEST							NONE	UPGLAC	
N 9301	NASSAU CO WTR	E 7		45	UNSD	DEST							NONE	UPGLAC	
N 9302	NASSAU CO WTR	E 7		45	UNSD	DEST							NONE	UPGLAC	
N 9303	NASSAU CO WTR	E 7		45	UNSD	DEST							NONE	UPGLAC	
N 9314	NASSAU CO DPW	E 7	1977	32	UNSD	OBS	54	-17 TO -22	5	4			NONE	PTWCU	
N 9315	NASSAU CO DPW	E 6	1977	9	UNSD	OBS	41	-27 TO -32	5	4	3.40	05-04-77	NONE	UPGLAC	
N 9316	NASSAU CO DPW	E 7	1977	25	UNSD	OBS	58	-28 TO -33	5	4	21.36	07-13-77	NONE	UPGLAC	
N 9317	NASSAU CO DPW	D 7	1977	218	UNSD	OBS	194	29 TO 24	5	4			NONE	MAGOTHY	
N 9334	GLEN COVE	E 6	1978	143	UNSD	TEST	631						NONE		
N 9334	GLEN COVE	E 6	1978	143	UNSD	TEST	603	-417 TO -460	43				TURB	LLOYD	
N 9334	GLEN COVE	E 6		143	P.S.	WTDR								MAGOTHY	
N 9353	NASSAU CO DPW	D 7	1978	143	UNSD	OBS	101	47 TO 42	5	4	57.82	05-11-78	NONE	MAGOTHY	
N 9455	REG.PLAN.BOARD	D 7	1977	184	UNSD	OBS	195	-6 TO -11	5	1.25	95.5	01-00-77	NONE	UPGLAC	
N 9456	REG.PLAN.BOARD	D 7	1977	184	UNSD	OBS	361	-172 TO -177	5	1.25	95.5	01-00-77	NONE	MAGOTHY	
N 9463	HICKSVILLE WD	D 7	1979	141	P.S.	WTDR	638	-419 TO -497	70	20				MAGOTHY	14
N 9464	MARVIN SCHUR	E 7	1979	22	DOM	WTDR	330	-298 TO -308	10	4	20	03-00-79	SUBM	LLOYD	
N 9478	NASSAU CO DPW	E 6	1978	9	UNSD	OBS	24	-10 TO -15	5	2	3.47	11-13-78	NONE	UPGLAC	
N 9488	HICKSVILLE WD	D 7	1979	161	UNSD	TEST	638						NONE		
N 9488	HICKSVILLE WD	D 7	1979	161	P.S.	WTDR	583		60	20				MAGOTHY	21
N 9489	S.L.LANG	D 7	1979	225	DOM	WTDR	198	32 TO 27	5	6	150	04-00-79	SUBM	MAGOTHY	
N 9520	OYSTER BAY WD	E 7	1979	90	UNSD	TEST	556						NONE		
N 9520	OYSTER BAY WD	E 7		90	P.S.	WTDR		-361 TO -422	61					PTWAQ	
N 9593	H.D.KOHLER	E 7	1979	5	DOM	WTDR	370	-353 TO -365	12	6				LLOYD	
N 9595	F.H.GILLMORE	E 7	1980	20	DOM	WTDR	467	-416 TO -447	31	6	+3	09-15-80	CENT	LLOYD	
N 9606	MICHAEL HURLEY	E 8		121	UNSD	TEST	203						NONE		
N 9606	MICHAEL HURLEY	E 8	1980	121	DOM	WTDR	134	-8 TO -13	5	4	106	12-00-79	SUBM	UPGLAC	

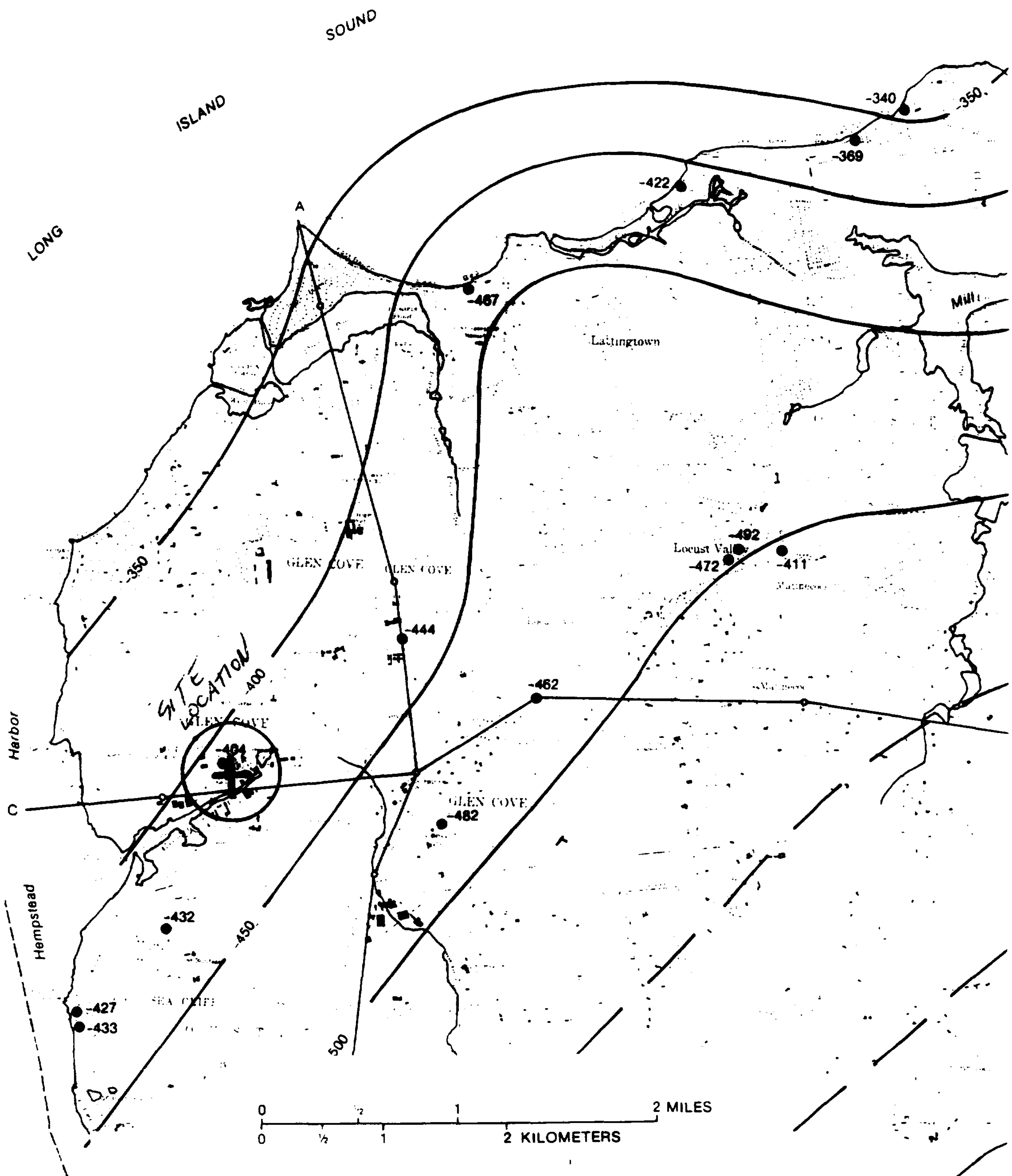
PLATE 1A. LOCATIONS OF

SELECTED WELLS AND TEST HOLES AND OF HYDROGEOLOGIC SECTIONS



104013

PLATE 2A. ALTITUDE AND CONFIGURATION OF BEDROCK SURFACE

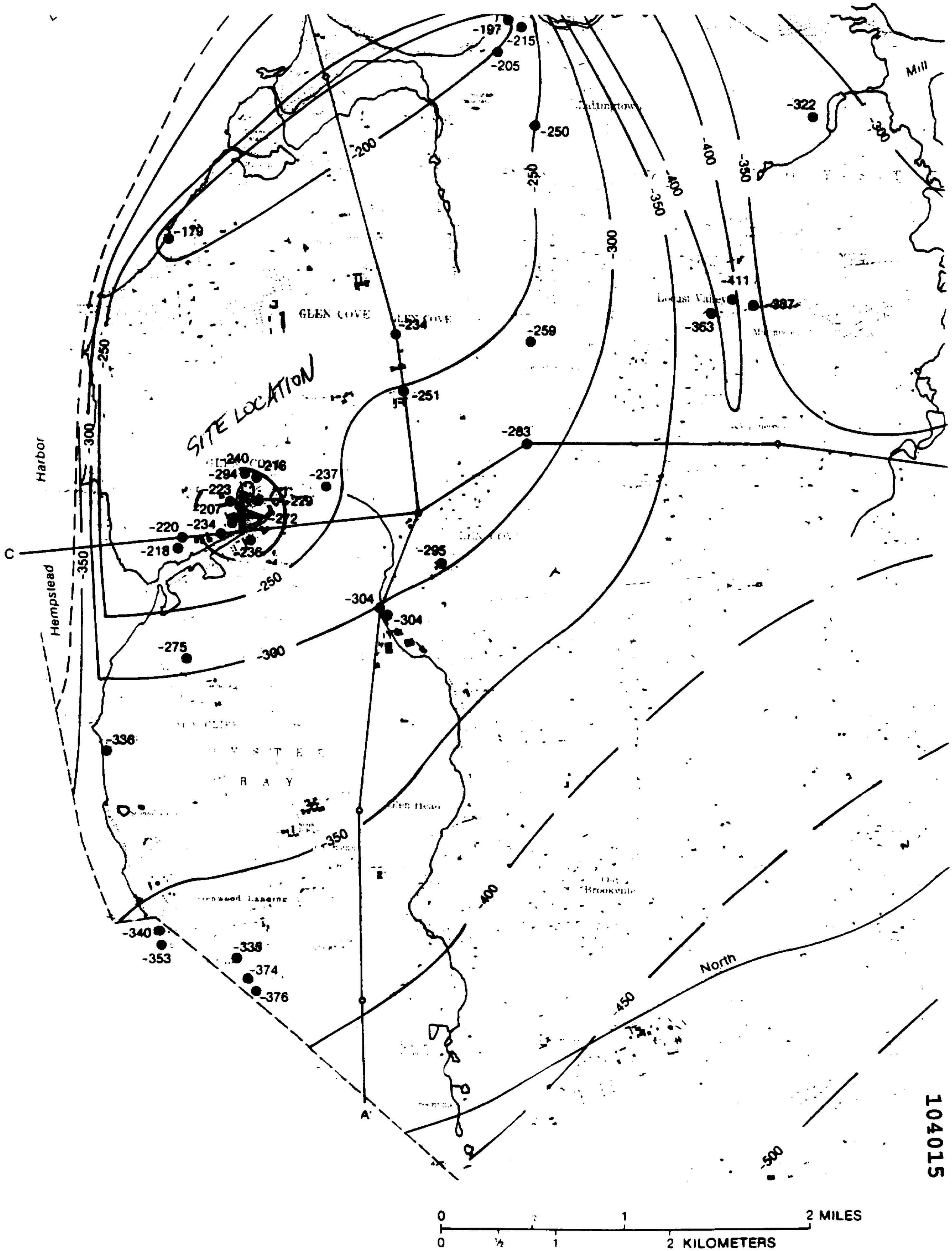


—— -450 —— LINE OF EQUAL BEDROCK-SURFACE ALTITUDE--Dashed where inferred. Contour interval 50 feet. Datum is NGVD of 1929.

● -462 WELL-DATA POINT--Number is aquifer-surface altitude, in feet below (-) NGVD of 1929.

A——o——A' LINE OF HYDROGEOLOGIC SECTION--Open circle is control point. (Sections are shown on plate 1B).

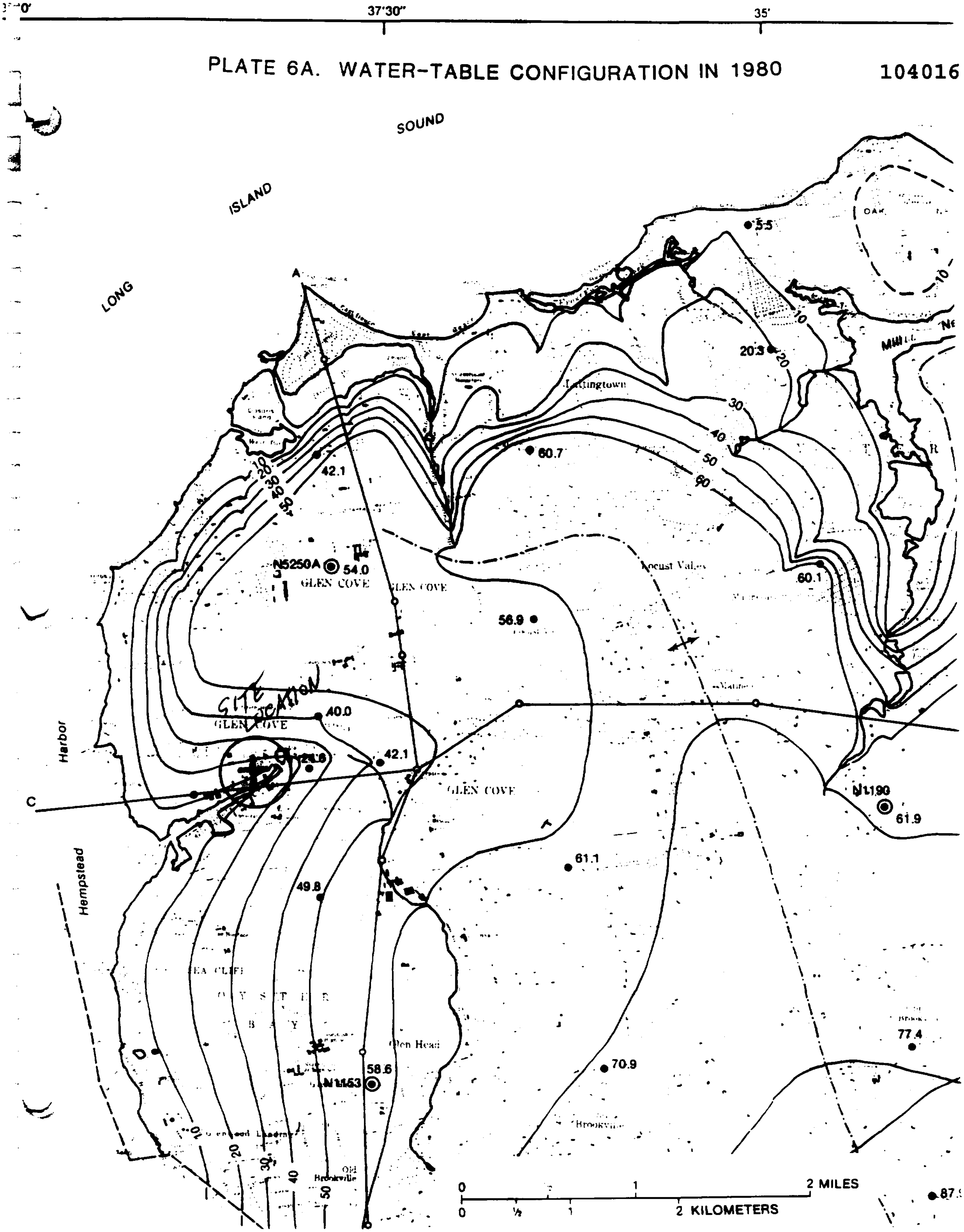
PLATE 2B. ALTITUDE AND CONFIGURATION OF THE LLOYD AQUIFER

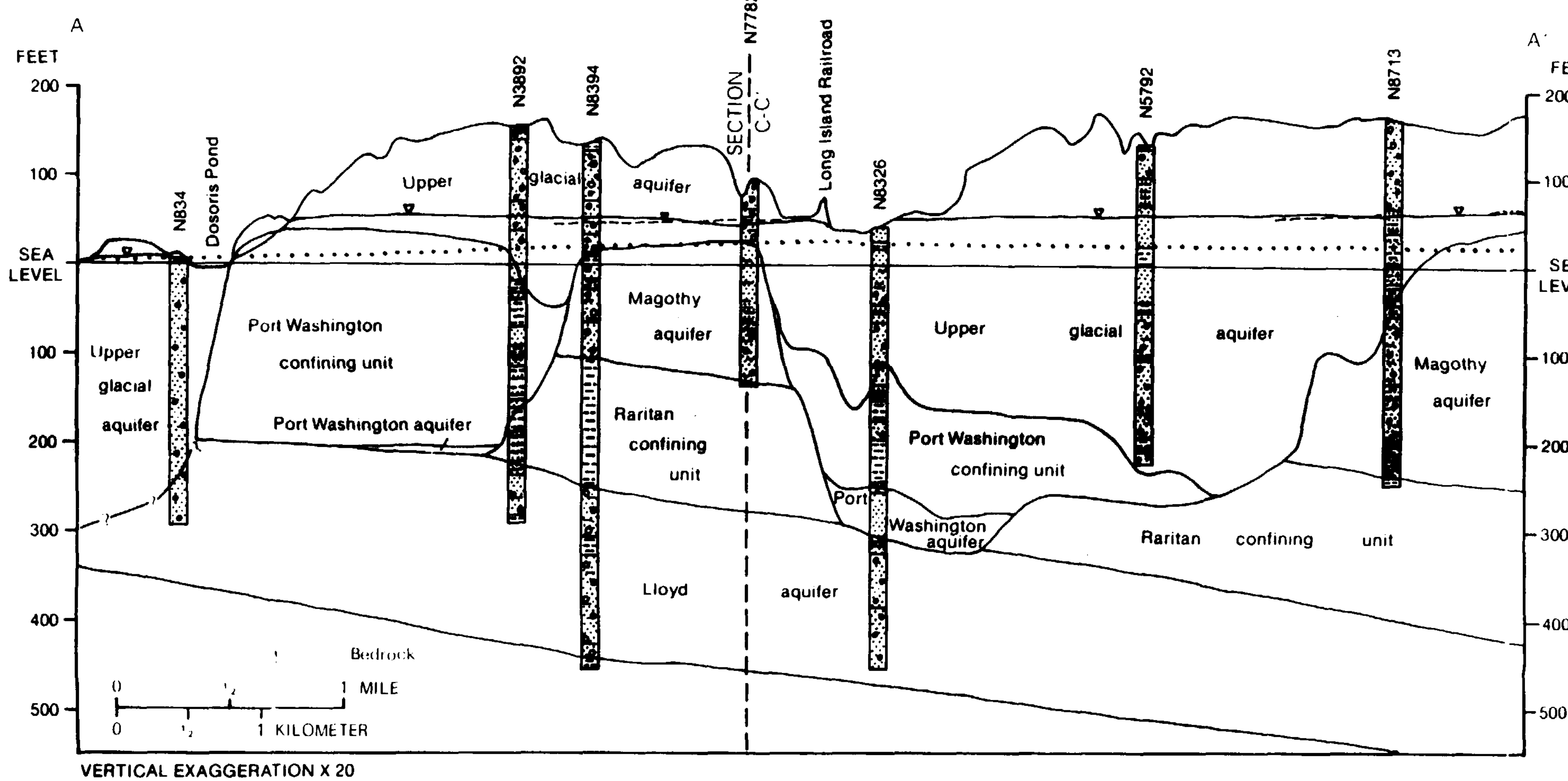


104015

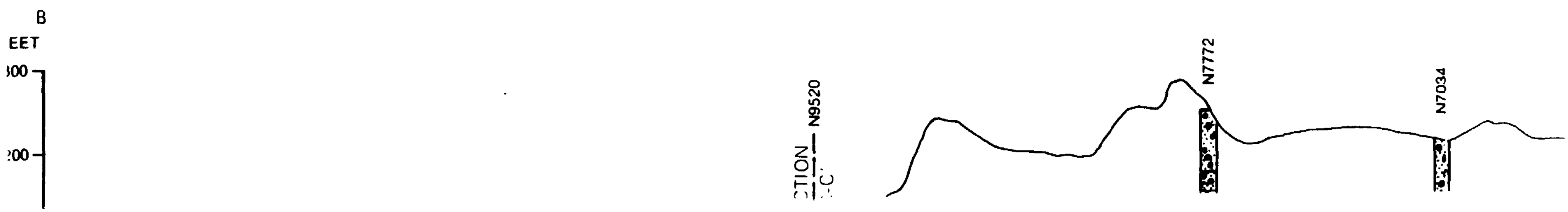
PLATE 6A. WATER-TABLE CONFIGURATION IN 1980

104016




A
A'
FEET
200
100
SEA LEVEL
100
200
300
400
500
N834
Dosoris Pond
N3892
N8394
SECTION C-C'
N7782
Long Island Railroad
N8326
N5792
N8713
Upper glacial aquifer
Port Washington confining unit
Port Washington aquifer
Magothy aquifer
Raritan confining unit
Lloyd aquifer
Port Washington aquifer
Raritan confining unit
Magothy aquifer
Bedrock
0 1/2 1 MILE
0 1/2 1 KILOMETER
VERTICAL EXAGGERATION X 20

104017


B
FEET
N9520
N7772
N7034

REFERENCE NO. 13

WELLS WITHIN 3 MILES OF LI TUNGSTEN, GLEN COVE, NY

UN = Unused, P.S. = Public Supply, IND = Independent, COM = Commercial, IRR = Irrigation, UNK = Unknown, AC = Air Conditioning

Well No.	Use	Contaminated
109	UN	
110	UN	
112	UN	
114	IRR	
115	UN	
116	UN	
117	UN	
118	P.S.	
119	P.S.	
120	UN	
121	UN	
121A	IRR	
660	IND	
661	UN	
801-818	UN	
834	UN	
835	P.S.	
842	UN	
901	P.S.	
902	P.S.	
903	P.S.	
904	UN	
905-909	P.S.	
1037	P.S.	
1149-1153	UN	
1171-1174	UN	
1327	P.S.	
1595	P.S.	
1651	P.S.	
1917	IND	
2027	UN	
2060	UN	
2087	IND	
2316	IND	X
2616	IRR	
3310	IND	
3466	P.S.	X
3892	UN	X
4432	COM	
4440	DOM	
4462	UN	
4639	UNK	
5071	IRR	
5201	P.S.	
5250	UN	
5261	UN	X

Well No.	Use	Contaminated
5450	IRR	
5762	UN	
5792	P.S.	
6289	UN	
6289	IRR	
6416	UN	
6444	IRR	
6549	IND	
6579	UNK	X
6587	UN	
6665	UN	
6668-70	UN	
6708	UN	
6806	IRR	
6881	UN	
6883	UN	
6973	UN	
7427	IND	X
7439	UNK	
7614	IND	
7664	IRR	
7782	AC	
7834	IRR	
7857	P.S.	
8048	UNK	
8224	IND	
8259	UN	
8326	P.S.	X
8327	P.S.	X
8394	UNK	
8690	UNK	
8709	IND	
8716	UN	
8887	IND	X
8898	UN	
8973	COM	
9066	UN	
9100	UN	
9115	UN	
9117	UN	
9210	P.S.	
9211	P.S.	
9334	P.S.	

REFERENCE NO. 14

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual
(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984

104022

PERMEABILITY

TABLE 2

PERMEABILITY OF GEOLOGIC MATERIALS*

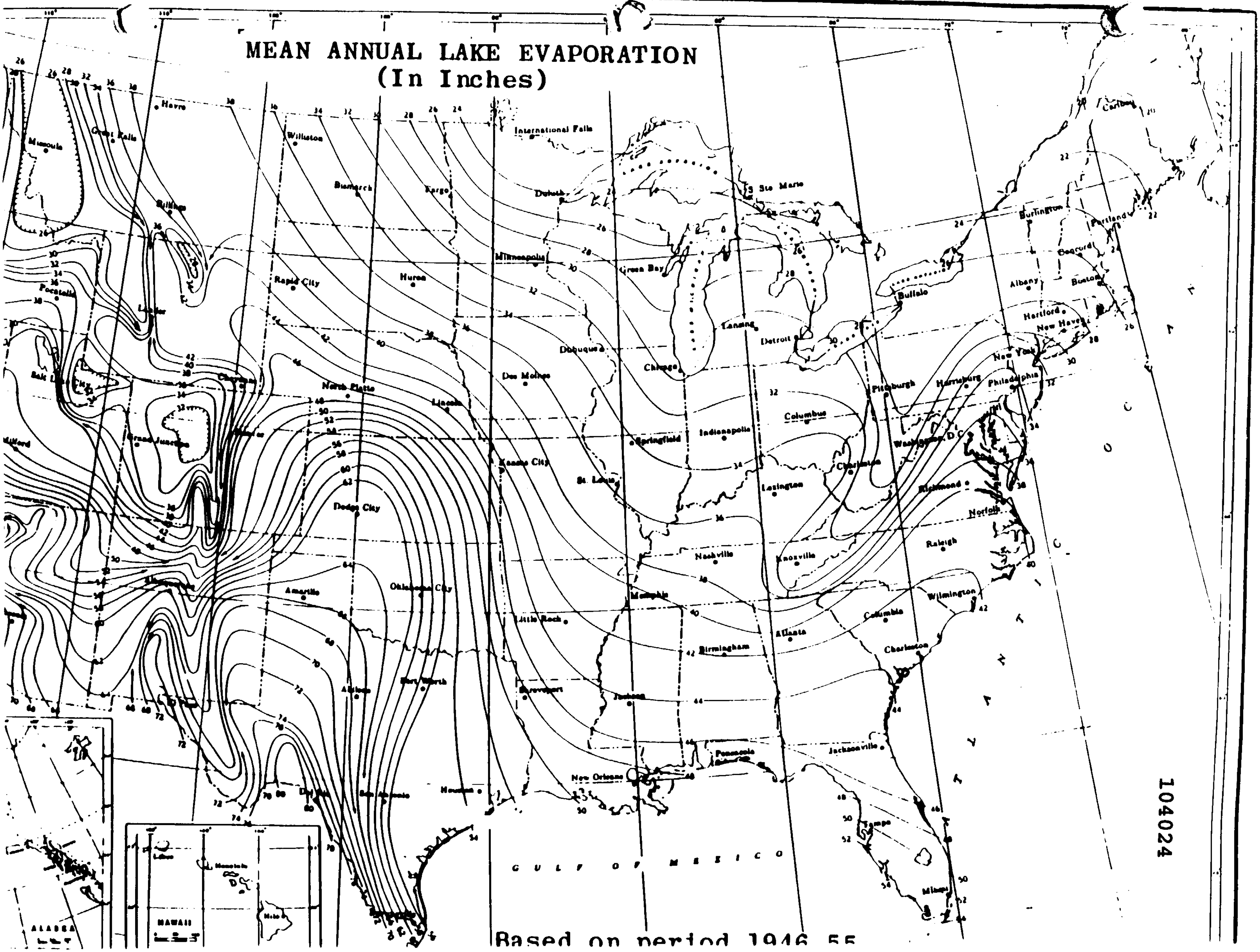
Type of Material	Approximate Range of Hydraulic Conductivity	Assigned Value
Clay, compact till, shale; unfractured metamorphic and igneous rocks	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till	$10^{-5} - 10^{-7}$ cm/sec	1
Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till	$10^{-3} - 10^{-5}$ cm/sec	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and dolomite	$>10^{-3}$ cm/sec	3

*Derived from:

Davis, S. N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWest ed., Academic Press, New York, 1969

Freeze, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979

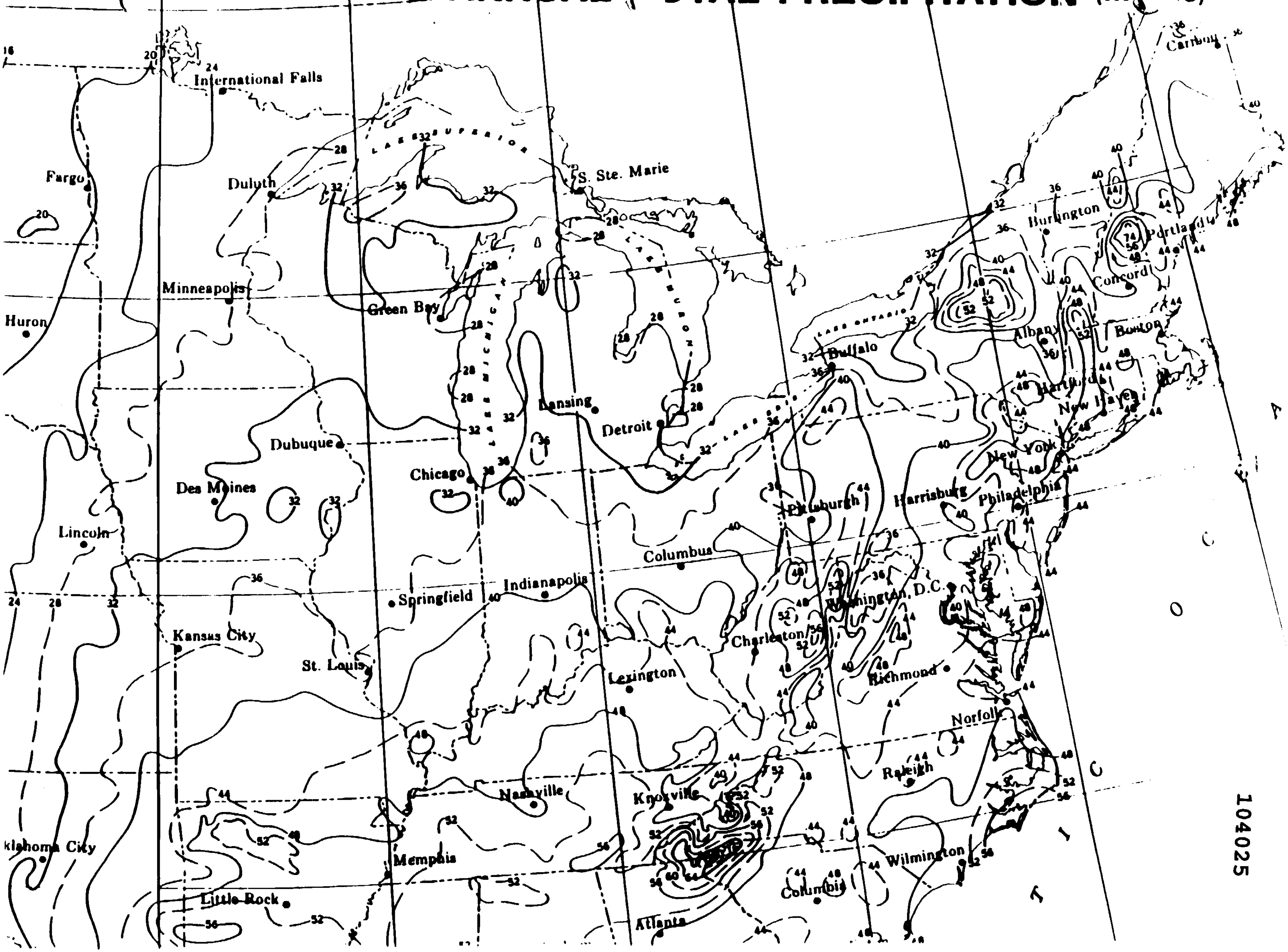
MEAN ANNUAL LAKE EVAPORATION
(In Inches)



Based on period 1946-55

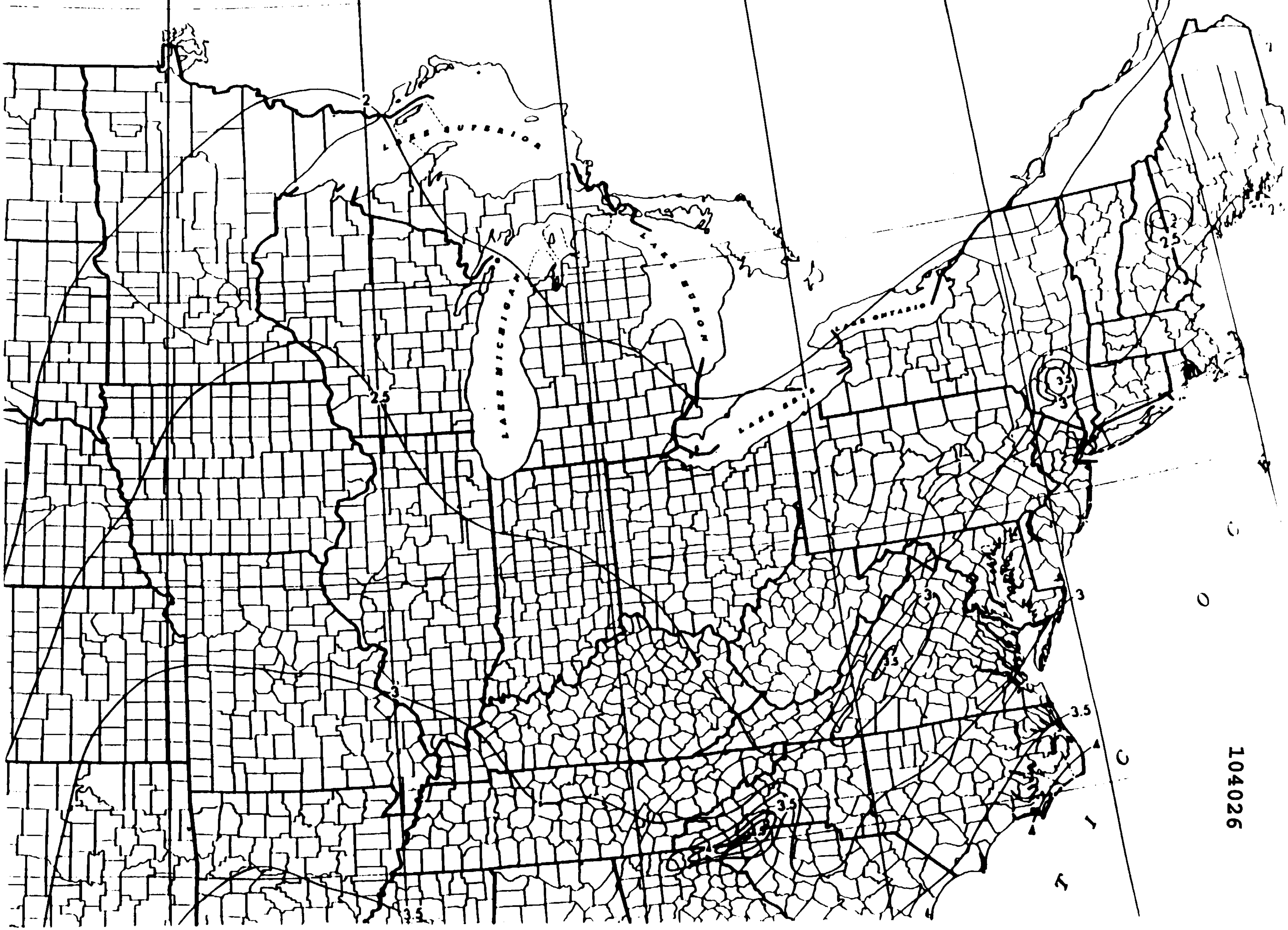
104024

NORMAL ANNUAL TOTAL PRECIPITATION (Inches)



104025

1 YEAR 24-HOUR RAINFALL (inches)



104026

REFERENCE NO. 15

NUS CORPORATION TELECON NOTE

CONTROL NO: 02-8902-06 **DATE:** 3/29/89 **TIME:** 0940

DISTRIBUTION:

Denton Avenue Landfill

BETWEEN: Don Myott, P.E. **OF:** NCDOH, Bureau of Public Water Supply **PHONE:** (516) 535-2201

AND: Brian Dietz, NUS Corp. (NUS)

DISCUSSION:

call concerning the "on-site" monitoring wells and groundwater usage within 3-miles of the site:

Mr Myott informed me of the following:

* the DA monitoring wells are located on county property (outside of the landfill) and are owned by NCDOH. The wells have 4" (diameter) casings (PVC, with screens. They are not equipped with pumps and NCDOH sampled them with a 4" submersible pump. There are no locks on the wells but the proper wrench is needed to unscrew the caps. The wells can be sampled at any time but NCDOH should be contacted ahead of time (2-3 days prior). The wells were last sampled in Nov/Dec 1982 (the analyses of these samples are presented in the EA Phase I Report that is located in the "Denton Ave Landfill" site file).
* ~~the~~ public supply wells ~~supply the~~ BD are the major source drinking water for the people within 3 miles of the site BD
* the number of private wells within 3 miles of the site is very small. The site is near the moraine and installing private wells can be very expensive. There may be some private industrial wells within 3 miles of the site. ~~however, all of the drinking water is supplied by public supply wells~~ BD
* the "on-site" recharge basin recharges the upper glacial aquifer
* two supply wells located immediately east of the site are "restricted use" due to the presence of organics. They may not be available for [illegible] because it [illegible]

~~ACTION ITEMS:~~

Mr. Myott will be sending:

copies of Hagstrom maps that pinpoint the public supply wells within 3 miles of the site, as well as information regarding the districts and number of people served by each. He will also try to send a copy of a report and oversized map (generated by an NCDOH consultant in 1986) that pinpoints all of the public supply, private supply, and industrial wells within Nassau County.

Brian Dietz
3/29/89

Cnty Loc | ⊕ | KUTL
(Town or County)

104029

REFERENCE NO. 16

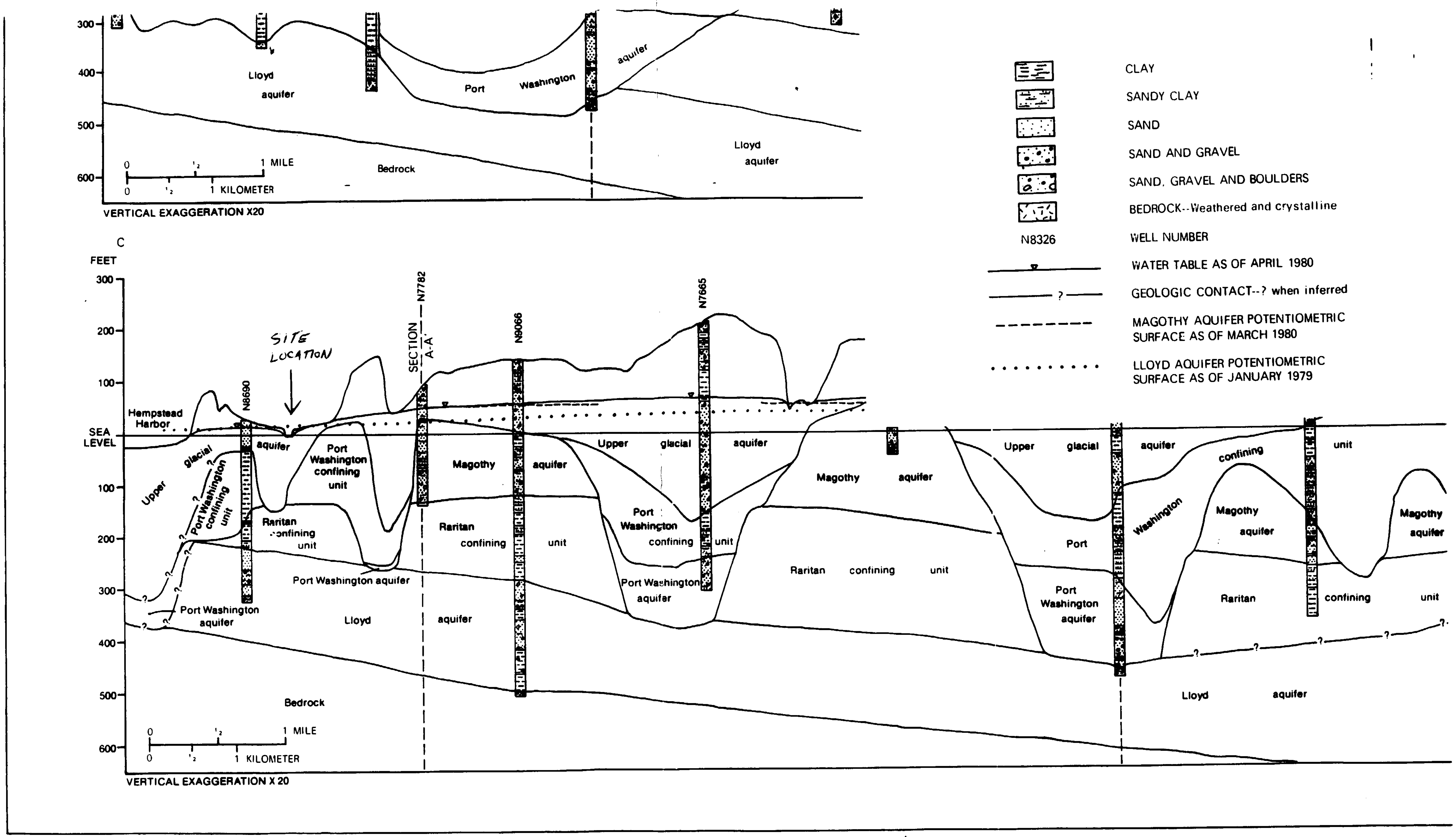


PLATE 1B. HYDROGEOLOGIC SECTIONS A-A', B-B', AND C-C'

RT OF THE TOWN OF OYSTER BAY, NASSAU COUNTY, NEW YORK, IN 1980

104031

for decisions on the use of specific tracts.

104032

LEGEND

1	IPSWICH-UDIPSAMMENTS: Dominantly nearly level, very poorly drained, organic soils and nearly level, moderately well drained to excessively drained, coarse-textured soils; on tidal flats
2	MONTAUK-ENFIELD: Dominantly nearly level to strongly sloping, well drained, medium-textured and moderately coarse textured soils; on knolls and hills
3	RIVERHEAD-ENFIELD-URBAN LAND: Dominantly nearly level to strongly sloping, well drained, moderately coarse textured and medium-textured soils and Urban land; on low hills and ridges
→ 4	RIVERHEAD-PLYMOUTH: Dominantly moderately steep or steep, well drained and excessively drained, moderately coarse textured and coarse-textured soils; on hillsides
5	UDIPSAMMENTS-BEACHES-URBAN LAND: Dominantly nearly level or gently sloping, excessively drained to moderately well drained, coarse-textured soils, Beaches, and Urban land; on barrier beaches
6	URBAN LAND: Dominantly nearly level or gently sloping areas that are covered by buildings, roads, sidewalks, and parking lots; on plains and low hills
7	URBAN LAND-HEMPSTEAD: Dominantly Urban land and nearly level, well drained, medium-textured soils; on plains
→ 8	URBAN LAND-MONTAUK-RIVERHEAD: Dominantly Urban land and nearly level to strongly sloping, well drained, medium-textured and moderately coarse textured soils; on low hills
9	URBAN LAND-RIVERHEAD: Dominantly Urban land and nearly level, well drained, moderately coarse textured soils; on plains
10	URBAN LAND-UDIPSAMMENTS-SUDBURY: Dominantly Urban land and nearly level, excessively drained to moderately well drained, coarse-textured and moderately coarse textured soils; on plains

COMPILED 1985

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
NASSAU COUNTY, NEW YORK

Scale 1:126,720

1 0 1 2 3 4 Miles

1 0 3 6 Km

IBER 2

4000 3000 2000 1000 0 5000 10000
Scale 1:24000

REFERENCE NO. 17

GSC-TR8645

GRAPHICAL EXPOSURE MODELING SYSTEM

(GEMS)

USER'S GUIDE

VOLUME 2. MODELING

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
EXPOSURE EVALUATION DIVISION
Task No. 3-2
Contract No. 68023970
Project Officer: Russell Kinerson
Task Manager: Loren Hall

Prepared by:

GENERAL SCIENCES CORPORATION
8401 Corporate Drive
Landover, Maryland 20785

Submitted: December 1, 1986

104035

GEMS> I

Li Tungsten
LATITUDE 40:51:42 LONGITUDE 73:38:17 1980 POPULATION

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	731	3631	5561	25505	12014	20416	67858
RING TOTALS	731	3631	5561	25505	12014	20416	67858

GEMS> I

Li Tungsten
LATITUDE 40:51:42 LONGITUDE 73:38:17 1980 HOUSING

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
1	242	1287	2079	8472	4040	7079	23199
RING TOTALS	242	1287	2079	8472	4040	7079	23199

Distance (miles)	Population	Houses
0-1/4	731	242
0-1/2	4362	1529
0-1	9923	3608
0-2	35428	12080
0-3	47442	16120
0-4	67858	23199

REFERENCE NO. 18

NUS CORPORATION AND SUBSIDIARIES **TELECON NOTE**

CONTROL NO:	DATE: 8/7/89	TIME: 16:40

DISTRIBUTION:

TO FILE - LI TUNGSTEN

07-8907-78

BETWEEN: JIM GILMORE	OF: NY DEC	PHONE: (516) 751-7900

AND:

STEVE OKULEWICZ, NUS CORP. EDISON

DISCUSSION:

ASKED MR. GILMORE ABOUT STATE WATER QUALITY CLASSIFICATION OF HEMPSTEAD HARBOR AND GLEN COVE CREEK. HE INFORMED ME THAT HEMPSTEAD HARBOR NORTH OF BAR BEACH IS CLASSIFIED AS SA - SUITABLE FOR SHELL FISHING FOR MARKET PURPOSES AND PRIMARY-SECONDARY CONTACT RECREATION. PRIMARY CONTACT RECREATION MEANS SWIMMING, SECONDARY CONTACT RECREATION MEANS FISHING. THE CLASSIFICATION FOR GLEN COVE CREEK FROM THE MOUTH TO PRATT'S POND IS CLASSIFIED AS CLASS I - SECONDARY CONTACT RECREATION EXCEPT FOR PRIMARY CONTACT RECREATION AND SHELL FISHING FOR MARKET PURPOSES.

ALSO, TO OBTAIN A COPY OF THE WATER QUALITY

~~ACTION ITEMS~~:

REGULATIONS FOR SURFACE AND GROUNDWATER TO CONTACT: PETER MACK - 518-457-3495, ASK FOR TITLE 6, CHAPTER 10, PART 700-705

NUS 067 REVISED 0685

104038

REFERENCE NO. 19

NUS CORPORATION AND SUBSIDIARIES — **TELECON NOTE**

CONTROL NO:	DATE: 8/4/89	TIME: 11:30

DISTRIBUTION:

FILE - LI TUNGSTEN
02-8907-78

BETWEEN: DEBRA ROTHBERG	OF: JONES, DAY, REVIS & POGUE	PHONE: (212) 326-3939

AND: STEVE CHULEWICZ NUS EDISON

DISCUSSION:

CALLED HER ABOUT OWNERSHIP OF LI TUNGSTEN, SHE INFORMED ME THAT THE OWNERS ARE GLEN COVE DEVELOPMENT COMPANY - 34 MARKET PLACE, BALTIMORE Md. ANY CORRESPONDENCE SHOULD BE MAILED TO DEBRA ROTHBERG — 599 LEXINGTON AVE, NYC 10022.

ACTION ITEMS:

REFERENCE NO. 20

NUS CORPORATION AND SUBSIDIARIES | **TELECON NOTE**

CONTROL NO:	DATE: 8/8/89	TIME: 9:30

DISTRIBUTION:
TO FILE - L.I. TUNGSTEN
02-8907-78

BETWEEN:	OF:	PHONE:
JIM GILMORE	NY DEC	(516) 751-7900

AND:
STEVE OKULEWICZ, NUS CORP, EDISON N.J.

DISCUSSION:

I ASKED MR. GILMORE IF ANY WETLANDS EXISTED WITHIN 2 MILES OF THE SITE THAT WERE GREATER THAN 5 ACRES IN AREA. HE SAID WETLANDS EXISTED IN THE GARVIES POINT PRESERVE BUT WERE NOT 5 ACRES IN AREA, THEY ARE SMALLER. I ALSO ASKED ABOUT FEDERALLY ENDANGERED SPECIES IN THE AREA. HE TOLD ME THAT NO OFFICIAL ANNOUNCEMENT HAS BEEN MADE BUT ARE CONSIDERING THE PEREGRINE FALCON TO BE LISTED. HE IS NOT SURE IF NESTING AREAS HAVE BEEN FOUND WITHIN 2 MILES OF L.I. TUNGSTEN.

ACTION ITEMS:

REFERENCE NO. 21

SUNY, Bldg. 40, Stony Brook, NY 11794-3070

September 28, 1987

Robert J. Mangan, P.E.
Director of Public Works
City Hall
Glen Cover, NY 11542

Dear Mr. Mangan:

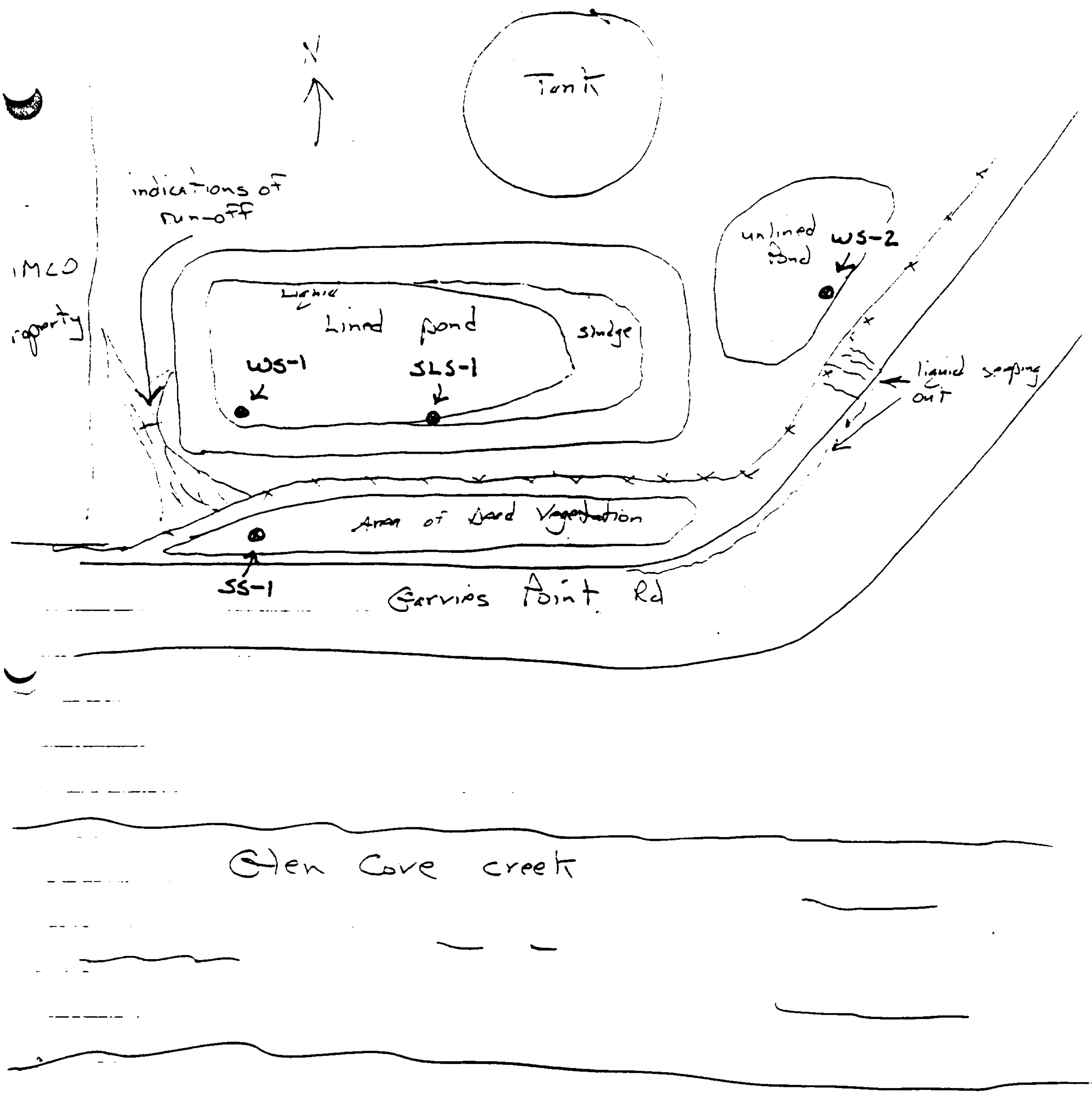
Some of the results are enclosed from the Li Tungsten site. These are the lined and unlined pond water tests, which we took on August 12, 1987.

The other results will follow soon. There was no heavy metal contamination found as shown here.

Sincerely,

Agnes Gara
Asst. Sanitary Engineer.

AG:cp
Enclosures


N
Tank
indications of run-off
IMCO property
Liquid
Lined pond
sludge
WS-1
SLS-1
unlined pond
WS-2
liquid seeping out
Area of dead Vegetation
SS-1
Garvies Point Rd
Glen Cove creek

104045

8-6-87 L.I. Tungsten Site Glen Cove

samples collected by J. Hofmann / Agnes Gara

1400 SS-1 soil sample, grab, collected near discolored soil and dead vegetation

1410 WS-1 water sample, grab, collected at south-west corner of Lined pond

1420 SLS-1 sludge sample, grab, collected south side of lined pond, just below surface of water-sludge interface

WS-2 Water sample, grab, collected at south side of unlined pond

104046

104047

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 871006657 SAMPLE RECEIVED:87/08/12/11 CHARGE: 4.89
PROGRAM: 6301:DIV. SOLID & HAZARDOUS WASTE - DEC REGION 1
SOURCE ID: DRAINAGE BASIN:17 GAZETTEER CODE:2901
POLITICAL SUBDIVISION:GLEN COVE C. COUNTY:NASSAU
LATITUDE: . LONGITUDE: . Z DIRECTION:
LOCATION: LI-TUNGSTEN GARVIES PT RD GLEN COVE
DESCRIPTION:WS-2 SOUTH SIDE OF UNLINED POND
REPORTING LAB: 10:LABORATORY OF INORGANIC ANALYTICAL CHEMISTRY - ALBANY
TEST PATTERN: 10-158:COMPLETE METAL SCAN - TOTAL RECOVERABLE
SAMPLE TYPE: 340:INDUSTRIAL WASTE, UNCHLORINATED
TIME OF SAMPLING: 87/08/06 14:27 DATE PRINTED:87/09/22

ANALYSIS: ICP-6 ICP GROUPING 6 - COMPLETE SCAN, TOTAL RECOVERABLE

----------PARAMETER----------	----------RESULT----------
MERCURY	< 0.2 MCG/L
ARSENIC, TOTAL RECOVERABLE	34. MCG/L
SELENIUM, TOTAL RECOVERABLE	< 5.0 MCG/L
BERYLLIUM, TOTAL RECOVERABLE	< 1. MCG/L
SILVER, TOTAL RECOVERABLE	< 10. MCG/L
BARIUM, TOTAL RECOVERABLE	240. MCG/L
CADMIUM, TOTAL RECOVERABLE	< 5. MCG/L
COBALT, TOTAL RECOVERABLE	600. MCG/L
CHROMIUM, TOTAL RECOVERABLE	20. MCG/L
COPPER, TOTAL RECOVERABLE	170. MCG/L
IRON, TOTAL RECOVERABLE	1,690. MCG/L
MANGANESE, TOTAL RECOVERABLE	400. MCG/L
NICKEL, TOTAL RECOVERABLE	90. MCG/L
STRONTIUM, TOTAL RECOVERABLE	3,670 MCG/L
TITANIUM, TOTAL RECOVERABLE	< 5. MCG/L
VANADIUM, TOTAL RECOVERABLE	10. MCG/L
ZINC, TOTAL RECOVERABLE	140. MG/L
LEAD, TOTAL RECOVERABLE	430. MCG/L
ANTIMONY, TOTAL RECOVERABLE	< 50. MCG/L
TIN, TOTAL RECOVERABLE	< 50. MCG/L
THALLIUM, TOTAL RECOVERABLE	< 20. MCG/L
ALUMINUM, TOTAL RECOVERABLE	450. MCG/L

FOLLOWING PARAMETERS NOT PART OF TEST PATTERN

----------PARAMETER----------	----------RESULT----------
MOLYBDENUM, TOTAL RECOVERABLE	1.7 MG/L
TUNGSTEN, TOTAL RECOVERABLE	< 50. MG/L

**** END OF REPORT ****

COPIES SENT TO: CO(1), RO(3), LPHE(1), FED( ), INFO-P( ), INFO-L( )

N.Y.S.DEPT.OF ENVIRONMENTAL CONSERVATION
REGION I HEADQUARTERS
BUILDING 40,STATE UNIVERSITY OF N.Y.
STONY BROOK,N.Y. 11790

SUBMITTED BY:HOFMANN

104048

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 871066658 SAMPLE RECEIVED:87/08/12/11 CHARGE: 4.89
PROGRAM: 6301:DIV. SOLID & HAZARDOUS WASTE - DEC REGION 1
SOURCE ID: DRAINAGE BASIN:17 GAZETTEER CODE:2901
POLITICAL SUBDIVISION:GLEN COVE C. COUNTY:NASSAU
LATITUDE: . LONGITUDE: . Z DIRECTION:
LOCATION: LI TUNGSTEN GARVIES PT RD GLEN COVE
DESCRIPTION:WS-1 SOUTHWEST CORNER LINED POND
REPORTING LAB: 10:LABORATORY OF INORGANIC ANALYTICAL CHEMISTRY - ALBANY
TEST PATTERN: 10-158:COMPLETE METAL SCAN - TOTAL RECOVERABLE
SAMPLE TYPE: 340:INDUSTRIAL WASTE, UNCHLORINATED
TIME OF SAMPLING: 87/08/06 14:10 DATE PRINTED:87/09/22

ANALYSIS: ICP-6 ICP GROUPING 6 - COMPLETE SCAN, TOTAL RECOVERABLE

PARAMETER	RESULT
MERCURY	0.3 MCG/L
ARSENIC, TOTAL RECOVERABLE	51. MCG/L
SELENIUM, TOTAL RECOVERABLE	< 5.0 MCG/L
BERYLLIUM, TOTAL RECOVERABLE	< 1. MCG/L
SILVER, TOTAL RECOVERABLE	14. MCG/L
BARIUM, TOTAL RECOVERABLE	76. MCG/L
CADMIUM, TOTAL RECOVERABLE	< 5. MCG/L
COBALT, TOTAL RECOVERABLE	605. MCG/L
CHROMIUM, TOTAL RECOVERABLE	6. MCG/L
COPPER, TOTAL RECOVERABLE	850. MCG/L
IRON, TOTAL RECOVERABLE	3,200. MCG/L
MANGANESE, TOTAL RECOVERABLE	832. MCG/L
NICKEL, TOTAL RECOVERABLE	201. MCG/L
STRONTIUM, TOTAL RECOVERABLE	115. MCG/L
TITANIUM, TOTAL RECOVERABLE	49. MCG/L
VANADIUM, TOTAL RECOVERABLE	7. MCG/L
ZINC, TOTAL RECOVERABLE	246. MG/L
LEAD, TOTAL RECOVERABLE	60. MCG/L
ANTIMONY, TOTAL RECOVERABLE	105. MCG/L
TIN, TOTAL RECOVERABLE	< 50. MCG/L
THALLIUM, TOTAL RECOVERABLE	< 20. MCG/L
ALUMINUM, TOTAL RECOVERABLE	1070. MCG/L

FOLLOWING PARAMETERS NOT PART OF TEST PATTERN

PARAMETER	RESULT
MOLYBDENUM, TOTAL RECOVERABLE	1.5 MG/L
TUNGSTEN, TOTAL RECOVERABLE	< 50. MG/L

**** END OF REPORT ****

COPIES SENT TO: CO(1), RO(3), LPHE(1), FED( ), INFO-P( ), INFO-L( )

N.Y.S.DEPT.OF ENVIRONMENTAL CONSERVATION
REGION 1 HEADQUARTERS
BUILDING 40,STATE UNIVERSITY OF N.Y.
STONY BROOK,N.Y. 11790

SUBMITTED BY:HOFMANN

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 871009130 SAMPLE RECEIVED:87/08/12/11 CHARGE: 72.57
PROGRAM: 6301:DIV. SOLID & HAZARDOUS WASTE - DEC REGION 1
SOURCE ID: DRAINAGE BASIN:17 GAZETTEER CODE:2901
POLITICAL SUBDIVISION:GLEN COVE C. COUNTY:NASSAU
LATITUDE: . LONGITUDE: . Z DIRECTION:
LOCATION: GT TUNGSTEN GARVIES PT RD GLEN COVE
DESCRIPTION:SLS-1 SOUTH SIDE OF LINED PD MIDDLE
REPORTING LAB: 10:LABORATORY OF INORGANIC ANALYTICAL CHEMISTRY - ALBANY
TEST PATTERN: 10-035:METALS IN SOLID MATERIAL
SAMPLE TYPE: 620:WET SLUDGE
TIME OF SAMPLING: 87/08/06 14:20 DATE PRINTED:87/09/24

DATA REPORTED WITH UNITS OF MG/L OR MCG/L ARE ANALYTICAL VALVES OBTAINED ON THE EP-TOT LEACHATE.

PARAMETER	RESULT
SOLIDS, DRY	23. PERCENT
ARSENIC IN DRY SOLIDS	1200. MCG/G
MERCURY IN DRY SOLIDS	1.4 MCG/G
SELENIUM IN DRY SOLIDS	0.5 MCG/G
BERYLLIUM IN DRY SOLIDS	116. MCG/G
SILVER IN DRY SOLIDS	< 8. MCG/G
BARIUM IN DRY SOLIDS	364. MCG/G
CADMIUM IN DRY SOLIDS	17.4 MCG/G
COBALT IN DRY SOLIDS	3240. MCG/G
CHROMIUM IN DRY SOLIDS	218. MCG/L
COPPER IN DRY SOLIDS	3820. MCG/G
MANGANESE IN DRY SOLIDS	8400. MCG/G
NICKEL IN DRY SOLIDS	896. MCG/G
STRONTIUM IN DRY SOLIDS	73. MCG/G
TITANIUM IN DRY SOLIDS	186. MCG/G
VANADIUM IN DRY SOLIDS	340. MCG/G
ZINC IN DRY SOLIDS	3280. MCG/G
MOLYBDENUM IN DRY SOLIDS	5960. MCG/L
ANTIMONY IN DRY SOLIDS	400. MCG/G
TIN IN DRY SOLIDS	800. MCG/G
THALLIUM IN DRY SOLIDS	< 16. MCG/L
ALUMINUM IN DRY SOLIDS	22600. MCG/G
DIGESTION OF SOLIDS FOR METALS	DONE
DIGESTION OF SOLIDS FOR HG	DONE

**** CONTINUED ON NEXT PAGE ****

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REGION 1 HEADQUARTERS
BUILDING 40, STATE UNIVERSITY OF N.Y.
STONY BROOK, N.Y. 11790

SUBMITTED BY:HOFMANN

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 871009130 SAMPLE RECEIVED:87/08/12/11 CHARGE: 22.57
POLITICAL SUBDIVISION:GLEN COVE C. COUNTY:NASSAU
LOCATION: LI TUNGSTEN CARBIDES PT RD GLEN COVE
TIME OF SAMPLING: 87/08/06 14:20 DATE PRINTED:87/09/24

FOLLOWING PARAMETERS NOT PART OF TEST PATTERN

PARAMETER	RESULT
TUNGSTEN IN DRY SOLIDS	< 5000. MCG/L
PREP OF SAMPLE FOR EP TOX	DONE

ANALYSIS: ICP-1 ICP GROUPING 1

PARAMETER	RESULT
MERCURY	< 0.2 MCG/L
ARSENIC	< 10. MCG/L
SELENIUM	< 5. MCG/L
LEAD	32. MCG/L
BERYLLIUM	123. MCG/L
SILVER	14. MCG/L
BARIUM	368. MCG/L
CADMIUM	56. MCG/L
COBALT	6600. MCG/L
CHROMIUM	5. MCG/L
COPPER	134. MCG/L
IRON	< 10. MCG/L
MANGANESE	14400. MCG/L
NICKEL	1690. MCG/L
STRONTIUM	3780. MCG/L
TITANIUM	< 5. MCG/L
VANADIUM	< 5. MCG/L
ZINC	5640. MCG/L
MOLYBDENUM	31. MCG/L
ANTIMONY	< 50. MCG/L
TIN	< 50. MCG/L
THALLIUM	37. MCG/L
ALUMINUM	9680. MCG/L

FOLLOWING PARAMETERS NOT PART OF TEST PATTERN

PARAMETER	RESULT
LEAD IN DRY SOLIDS	17800. MCG/G

FOLLOWING PARAMETERS NOT PART OF TEST PATTERN

PARAMETER	RESULT
IRON IN DRY SOLIDS	129000. MCG/G

**** END OF REPORT ****

Bob [illegible]
518-474-0516

104050

0321 NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

PAGE 1 RESULTS OF EXAMINATION FINAL REPORT

SAMPLE ID: 871009131 SAMPLE RECEIVED:87/08/12/11 CHARGE: 22.57
PROGRAM: 6301:DIV. SOLID & HAZARDOUS WASTE - DEC REGION 1
SOURCE ID: DRAINAGE BASIN:17 GAZETTEER CODE:2901
POLITICAL SUBDIVISION:GLEN COVE C. COUNTY:NASSAU
LATITUDE: . LONGITUDE: . Z DIRECTION:
LOCATION: LI TUNGSTEN GARVIES PT RD GLEN COVE
DESCRIPTION:SS-3 WEST END OF DEAD VEGETATION S OF LINED POND
REPORTING LAB: 10:LABORATORY OF INORGANIC ANALYTICAL CHEMISTRY - ALBAN
TEST PATTERN: 10-035:METALS IN SOLID MATERIAL
SAMPLE TYPE: 600:SOIL, SAND
TIME OF SAMPLING: 87/08/06 14:00 DATE PRINTED:87/09/24

DATA REPORTED WITH UNITS OF MG/L OR MCG/L ARE ANALYTICAL VALVES OBTAINED ON THE EP-TOT LEACHATE.

-----------PARAMETER-----------	-----------RESULT-----------
SOLIDS, DRY	85. PERCENT
ARSENIC IN DRY SOLIDS	5700. MCG/G
MERCURY IN DRY SOLIDS	0.67 MCG/G
SELENIUM IN DRY SOLIDS	6.3 MCG/G
BERYLLIUM IN DRY SOLIDS	2.8 MCG/G
SILVER IN DRY SOLIDS	< 8. MCG/G
BARIUM IN DRY SOLIDS	63. MCG/G
CADMIUM IN DRY SOLIDS	104. MCG/G
COBALT IN DRY SOLIDS	34. MCG/G
CHROMIUM IN DRY SOLIDS	13.6 MCG/L
COPPER IN DRY SOLIDS	5320. MCG/G
MANGANESE IN DRY SOLIDS	112. MCG/G
NICKEL IN DRY SOLIDS	28.4 MCG/G
STRONTIUM IN DRY SOLIDS	79. MCG/G
TITANIUM IN DRY SOLIDS	166. MCG/G
VANADIUM IN DRY SOLIDS	13. MCG/G
ZINC IN DRY SOLIDS	6040. MCG/G
MOLYBDENUM IN DRY SOLIDS	886. MCG/L
ANTIMONY IN DRY SOLIDS	44. MCG/G
TIN IN DRY SOLIDS	< 40. MCG/G
THALLIUM IN DRY SOLIDS	< 16. MCG/L
ALUMINUM IN DRY SOLIDS	4980. MCG/G
DIGESTION OF SOLIDS FOR METALS	DONE
DIGESTION OF SOLIDS FOR HG	DONE

**** CONTINUED ON NEXT PAGE ****

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N.Y.S.DEPT.OF ENVIRONMENTAL CONSERVATION
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BUILDING 40,STATE UNIVERSITY OF N.Y.
STONY BROOK,N.Y. 11790

SUBMITTED BY:HOFMANN

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

2

RESULTS OF EXAMINATION — FINAL REPORT

SAMPLE ID: 671009131 SAMPLE RECEIVED:87/08/12/11 CHARGE: 22.57
POLITICAL SUBDIVISION:GLEN COVE C. COUNTY:NASSAU
LOCATION: LI TUNGSTEN GARVIES PT RD GLEN COVE
TIME OF SAMPLING: 87/08/06 14:00 DATE PRINTED:87/09/24

FOLLOWING PARAMETERS NOT PART OF TEST PATTERN

PARAMETER	RESULT
TUNGSTEN IN DRY SOLIDS	< 5000. MCG/L
PREP OF SAMPLE FOR EP TOX	DONE

ANALYSIS: ICP-1 ICP GROUPING 1

PARAMETER	RESULT
MERCURY	< 0.2 MCG/L
ARSENIC	180. MCG/L
SELENIUM	< 5. MCG/L
LEAD	4600. MCG/L
BERYLLIUM	< 1. MCG/L
SILVER	24. MCG/L
BARIUM	46. MCG/L
CADMIUM	59. MCG/L
COBALT	55. MCG/L
CHROMIUM	12. MCG/L
COPPER	2700. MCG/L
IRON	5850. MCG/L
MANGANESE	127. MCG/L
NICKEL	37. MCG/L
STRONTIUM	93. MCG/L
TITANIUM	< 5. MCG/L
VANADIUM	< 5. MCG/L
ZINC	1930. MCG/L
MOLYBDENUM	60. MCG/L
ANTIMONY	98. MCG/L
TIN	< 50. MCG/L
THALLIUM	< 20. MCG/L
ALUMINUM	4950. MCG/L

FOLLOWING PARAMETERS NOT PART OF TEST PATTERN

PARAMETER	RESULT
LEAD IN DRY SOLIDS	37600. MCG/G

FOLLOWING PARAMETERS NOT PART OF TEST PATTERN

PARAMETER	RESULT
IRON IN DRY SOLIDS	74000. MCG/G

**** END OF REPORT ****

REFERENCE NO. 22

New York State Department of Environmental Conservation

MEMORANDUM

TO: Li Tungsten File — File.
FROM: ~~R. Becherer~~
SUBJECT: Analytical Data

DATE: July 15, 1986

The following data has been collected at the Li Tungsten site. (See attached map)

AREA

1. This sample was collected from six of the drums in the main processing area.

3. These samples were taken from the lined basin just north of Garvies Point Road.

4. These three samples were collected from three disposal sites in area four. There is a northern, middle and southern runoff area.

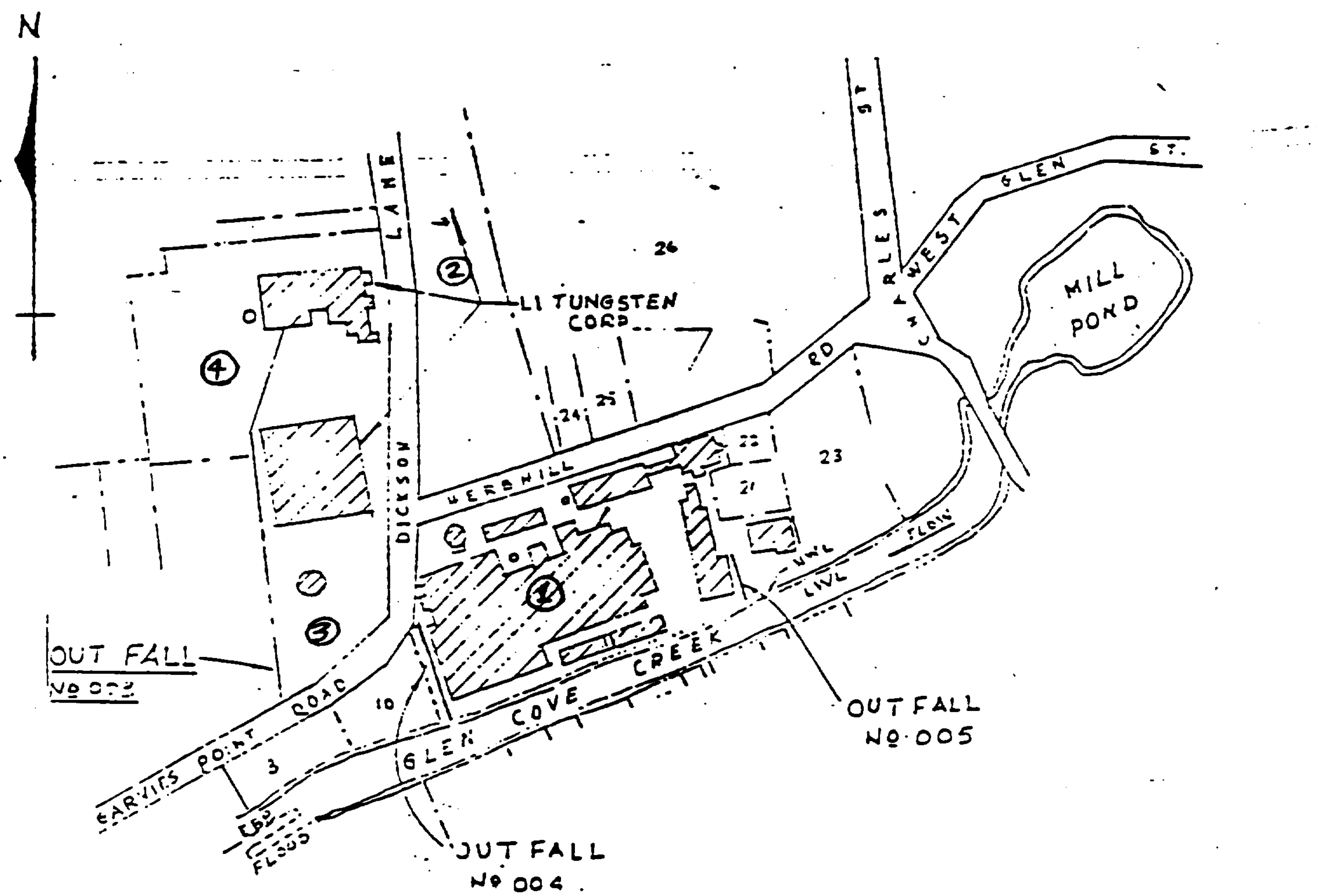
004 This data is from one of the facility's wastewater discharges.

Robert A Becherer

RB:11

Attachment

cc: G. Brezner
T. Candela


N
LI TUNGSTEN CORP
26
MILL POND
GLEN ST.
WEST GLEN
CHARLES ST
RD
HERBHILL
DICKSON LANE
24
25
23
22
21
10
3
GLEN COVE CREEK
GARVIES POINT ROAD
OUT FALL
OUT FALL
NO. 005
OUT FALL
NO 004
FLOW

NASSAU COUNTY DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH LABORATORIES

TRACE ORGANICS

Access Number:	583335
Source:	LI TUNGSTEN, 63 HERB HILL RD., GLEN COVE
Matrix:	WATER
Site:	OUTFALL 004
Date Sampled:	11/27/85
Date of Report:	12/04/85

VOLATILE HALOGENATED	MRC (ug/l)	RESULT (ug/l)
TRICHLOROFLUOROMETHANE	NR	NA
METHYLENE CHLORIDE / 1,1,2-TRICHLOROTRIFLUOROETHANE / 1,1-DICHLOROETHYLENE	6	11
c & t-1,2-DICHLOROETHYLENE	14	NR
1,1-DICHLOROETHANE	NR	NR
CHLOROFORM	1	[illegible]
1,1,1-TRICHLOROETHANE	1	1
CARBON TETRACHLORIDE	1	[illegible]
TRICHLOROETHYLENE	1	[illegible]
BROMODICHLOROMETHANE	1	[illegible]
c-1,3-DICHLOROPROPENE / DIBROMOCHLOROMETHANE	1	[illegible]
1,1,2-TRICHLOROETHANE	1	[illegible]
1,2-DIBROMOETHANE	1	[illegible]
TETRACHLOROETHYLENE	1	[illegible]
BROMOFORM	2	[illegible]

VOLATILE AROMATICS	MRC (ug/l)	RESULT (ug/l)
BENZENE	2	NA
TOLUENE	4	NA
CHLOROBENZENE	2	NA
ETHYLBENZENE	3	NA
XYLENE (o,m,p)	6	NA
DICHLOROBENZENE (o,m,p)	11	NA

MRC - MINIMUM REPORTABLE CONCENTRATION NA - NOT ANALYZED
NR - NO RESULT DUE TO TECHNICAL REASONS - RESAMPLE SUGGESTED
PPB: AIR - nl/l WATER - ug/l SOIL - ng/g

DEC 05 1985

LABORATORY REPORT

CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES

Division of Laboratories and Research

Nassau County Department of Health

1 ☐ Routine	Lab. No. 13652
2 ☐ Resample	
3 ☑ Special	
4 ☐ Complaint	Field No. VN196
5 ☐ Other	

Source Information (Please Print)

Premises: Li Tungsten

Address: 63 Herb Hill Rd.

Town: Glen Cove

Collection Point: composite of sludge from 6 drums on Li property

Sampler's Comments:

-claylike; dk brown color

-EP Toxicity

	Month	Day	Year
Date Collected	12	13	85
Date Received	DEC 13		1985
Date Reported			8

Collection Time: 11 : am

Collected By: L. Nigro

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☑ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION / SPECIAL ANALYSIS

Check	Metals		Result	Check	Non-Metals		Result	Check	Constituent	Result
1	Aluminum	mg/l	25.0	15	Chloride	mg/l		29	Chromium hex. mg/l	
2	Arsenic	mg/l	<0.005	16	Cyanide	mg/l		30	FINAL pH	5.5
3	Barium	mg/l	<0.5	17	Fluoride	mg/l		31		
4	Cadmium	mg/l	0.33	18	MBAS	mg/l		32		
5	Chromium, Total	mg/l	<0.01	19	pH INITIAL		10.3	33		
6	Copper	mg/l	34.5	20	Phenols	mg/l		34		
7	Iron, Total	mg/l	0.41	21	Solids, Suspended	mg/l		35		
8	Lead	mg/l	0.04	22	Solids, Total Diss.	mg/l		36		
9	Manganese	mg/l	20.0	23	Sulfate	mg/l		37		
10	Mercury	mg/l		24	Ammonia nitrogen	mg/l		38		
11	Nickel	mg/l	32.0	25	Kjeldahl nitrogen	mg/l		39		
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l		40		
13	Silver	mg/l		27	Nitrate nitrogen	mg/l		41		
14	Zinc	mg/l	21.5	28	Total Phos.	mg/l		42		

Examiner's Comments

104057

LABORATORY REPORT

CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES

Division of Laboratories and Research
Nassau County Department of Health

1 ☐ Routine
2 ☐ Resample
3 ☑ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 13651

Field No. UN-195

Source Information (Please Print)

		Month	Day	Year
Premises: Li Tungsten	Date Collected	12	13	85
Address: 63 Herb Hill Rd	Date Received	DEC	13	85
Town: Glen Cove	Date Reported			8

Collection Point: composite of recharge basin soil, across street from Li; on Garvies Pt. Rd.

Collection Time: 10:50 am

Collected By: U. Nigro

Sampler's Comments:
- sample orange
- EP Toxicity

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☑ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals		Result	Check	Non-Metals		Result
1	Aluminum	mg/l	25.0	15	Chloride	mg/l	
2	Arsenic	mg/l	0.015	16	Cyanide	mg/l	
3	Barium	mg/l	<0.5	17	Fluoride	mg/l	
4	Cadmium	mg/l	0.094	18	MBAS	mg/l	
5	Chromium, Total	mg/l	0.02	19	pH INITIAL		9.5
6	Copper	mg/l	4.45	20	Phenols	mg/l	
7	Iron, Total	mg/l	0.10	21	Solids, Suspended	mg/l	
8	Lead	mg/l	0.08	22	Solids, Total Diss.	mg/l	
9	Manganese	mg/l	13.3	23	Sulfate	mg/l	
10	Mercury	mg/l		24	Ammonia nitrogen	mg/l	
11	Nickel	mg/l	6.75	25	Kjeldahl nitrogen	mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
13	Silver	mg/l		27	Nitrate nitrogen	mg/l	
14	Zinc	mg/l	10.5	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent		Result
29	Chromium hex.	mg/l	
30	FINAL pH		5.6
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			

Examiner's Comments

104058

CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES
Division of Laboratories and Research
Nassau County Department of Health

1 ☐ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 24

Field No VN-180

Source Information (Please Print)

Premises: Li Tungsten
Address: 63 Herb Hill Rd
Town: Glen Cove
Collection Point: catch basin / lagoon. soil sample

	Month	Day
Date Collected	10	
Date Received	10	7
Date Reported		

Collection Time: 10 :00
Collected By: U. Nisw

Sampler's Comments:
- Extraction procedure, please
- DEC sample taken during hurricane

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☑ Soil
C ☐ Sludge
D ☐ Waste Solv
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals		Result	Check	Non-Metals		Result
1	Aluminum	mg/l	3.0	15	Chloride	mg/l	
2	Arsenic	mg/l	0.037	16	Cyanide	mg/l	
3	Barium	mg/l	<0.5	17	Fluoride	mg/l	
4	Cadmium	mg/l	0.063	18	MBAS	mg/l	
5	Chromium, Total	mg/l	<0.01	19	pH INITIAL		3.5
6	Copper	mg/l	4.10	20	Phenols	mg/l	
7	Iron, Total	mg/l	10.50	21	Solids, Suspended	mg/l	
8	Lead	mg/l	0.38	22	Solids, Total Diss.	mg/l	
9	Manganese	mg/l	0.27	23	Sulfate	mg/l	
10	Mercury	mg/l	INTER-FERENCE	24	Ammonia nitrogen	mg/l	
11	Nickel	mg/l	0.10	25	Kjeldahl nitrogen	mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
13	Silver	mg/l	<0.05	27	Nitrate nitrogen	mg/l	
14	Zinc	mg/l	0.72	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent		R
29	Chromium hex.	mg/l	
30	Final pH		3
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			

Examiner's Comments

ORATORY REPORT

HEMICAL EXAMINATION OF INDUSTRIAL
ND HAZARDOUS WASTES

Division of Laboratories and Research
ssau County Department of Health

P

1 ☑ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 1914

Field No. VN-74

Source Information (Please Print)

		Month	Day	Year
Premises: Li Tungsten	Date Collected	4	4	86
Address: [illegible] Rd	Date Received			8
Town: [illegible]	Date Reported			8
Collection Point: across [illegible] Tungsten	Collection Time	1:15 PM		
northernmost pile of soil - access - Twist Ct.	Collected By:	V. [illegible]		

Sampler's Comments:

- EP Toxicity
- Li property

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☑ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals		Result	Check	Non-Metals		Result
1	Aluminum	mg/l	<0.5	15	Chloride	mg/l	
	Arsenic	mg/l	0.033	16	Cyanide	mg/l	
3	Barium	mg/l	<0.5	17	Fluoride	mg/l	
	Cadmium	mg/l	<0.001	18	MBAS	mg/l	
5	Chromium, Total	mg/l	<0.01	19	pH initial		3.8
	Copper	mg/l	0.17	20	Phenols	mg/l	
	Iron, Total	mg/l	0.64	21	Solids, Suspended	mg/l	
	Lead	mg/l	0.04	22	Solids, Total Diss.	mg/l	
	Manganese	mg/l	0.16	23	Sulfate	mg/l	
	Mercury	mg/l	<0.0005	24	Ammonia nitrogen	mg/l	
	Nickel	mg/l	<0.05	25	Kjeldahl nitrogen	mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
	Silver	mg/l	<0.05	27	Nitrate nitrogen	mg/l	
14	Zinc	mg/l	0.12	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent		Result
29	Chromium hex.	mg/l	
30	final pH		3.1
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			

Examiner's Comments

MAY 16 1986

104060

CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES

Division of Laboratories and Research

Nassau County Department of Health

1 ☑ ~~Routine~~
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 1915

Field No. VN-75

Site Information (Please Print)

Premises: Li Tungsten

Address: [illegible] Hill Rd

Town: Glen Cove

Collection Point: across the street [illegible] Tungsten middle pile of soil - west of fenced tank

Sampler's Comments:

EP Toxicity

- across Janet Ct.

property

	Month	Day	Year
Date Collected	4	4	86
Date Received			8
Date Reported			8

Collection Time: 1:20 pm

Collected By: V. Ni[illegible]

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☑ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals		Result	Check	Non-Metals		Result
1	Aluminum	mg/l	<0.5	15	Chloride	mg/l	
2	Arsenic	mg/l	0.041	16	Cyanide	mg/l	
3	Barium	mg/l	<0.5	17	Fluoride	mg/l	
4	Cadmium	mg/l	<0.001	18	MBAS	mg/l	
5	Chromium, Total	mg/l	<0.01	19	pH initial		3.6
6	Copper	mg/l	1.17	20	Phenols	mg/l	
7	Iron, Total	mg/l	3.75	21	Solids, Suspended	mg/l	
8	Lead	mg/l	0.09	22	Solids, Total Diss.	mg/l	
9	Manganese	mg/l	0.15	23	Sulfate	mg/l	
10	Mercury	mg/l	<0.0005	24	Ammonia nitrogen	mg/l	
11	Nickel	mg/l	<0.05	25	Kjeldahl nitrogen	mg/l	
12	Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
13	Silver	mg/l	<0.05	27	Nitrate nitrogen	mg/l	
14	Zinc	mg/l	0.13	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent	Result
29	Chromium hex. mg/l	
30	final pH	3.6
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		

Examiner's Comments

MAY 16 1986

104061

LABORATORY REPORT

CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES

Division of Laboratories and Research

Nassau County Department of Health

1 ☑ Routine
2 ☐ Resample
3 ☐ Special
4 ☐ Complaint
5 ☐ Other

Lab. No. 1913

Field No. VN-74

Source Information (Please Print)

Premises: Li Tungsten

Address: [illegible]

Town: Glen Cove

Collection Point: across the street from Li Tungsten [illegible] soil / runoff - running in SE direction

Sampler's Comments:

- EP Toxicity - across [illegible] Ct.

- Li property

	Month	Day	Year
Date Collected	[illegible]	[illegible]	8[illegible]
Date Received			8
Date Reported			8

Collection Time: [illegible]

Collected By: [illegible]

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☐ Water
B ☑ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals		Result	Check	Non-Metals		Result
1	Aluminum EO	mg/l	<0.5	15	Chloride	mg/l	
2	Arsenic EO	mg/l	<0.005	16	Cyanide	mg/l	
3	Barium EO	mg/l	<0.5	17	Fluoride	mg/l	
4	Cadmium EO	mg/l	<0.001	18	MBAS	mg/l	
5	Chromium, Total EO	mg/l	<0.01	19 EO	pH initial		3.8
6	Copper MT	mg/l	0.14	20	Phenols	mg/l	
7	Iron, Total MI	mg/l	0.19	21	Solids, Suspended	mg/l	
8	Lead EO	mg/l	0.09	22	Solids, Total Diss.	mg/l	
9	Manganese MT	mg/l	0.33	23	Sulfate	mg/l	
10	Mercury MT	mg/l	<0.0005	24	Ammonia nitrogen	mg/l	
11	Nickel MT	mg/l	<0.05	25	Kjeldahl nitrogen	mg/l	
12	Selenium EO	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
13	Silver MT	mg/l	<0.05	27	Nitrate nitrogen	mg/l	
14	Zinc MT	mg/l	0.13	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent	Result
29	Chromium hex. mg/l	
30	EO final pH	3.1
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		

Examiner's Comments

MAY 16 1986

104062

REFERENCE NO. 23

0024-C
02-8703-68

New York State Department of Environmental Conservation
Wildlife Resources Center
Delmar, NY 12054

RECEIVED
APR 16 1987
NUS CORPORATION
SENT TO ___

Henry G. Williams
Commissioner

April 10, 1987

Mr. David J. Grupp
NUS Corporation
Fieldcrest Avenue
Raritan Plaza III
Edison, NJ 08837

Dear Mr. Grupp:

We have reviewed the Significant Habitat Program and the Natural Heritage Program files with respect to the proposed project in the Town of Oyster Bay, Nassau County, NY.

We have identified the following potential concerns:

One Mile Radius

Rare Plants

Aristolochia serpentaria - Virginia snakeroot. This was last collected in 1879 in the vicinity of Glen Cove, NY. This is listed as "SH", State Historical, by the NY Natural Heritage Program. This means that no extant sites are known but that it may be rediscovered.

Two Mile Radius

Rare Plants

Aristolochia serpentaria - Virginia snakeroot. This was last collected in 1915 in the vicinity of Sea Cliff, NY.

Asclepias variegata - White milkweed. This was collected in the vicinity of Glen Cove, NY; however, no date was recorded. It is listed as "S1," critically imperiled in NYS because of extreme rarity, by the NY Natural Heritage Program.

Significant Habitats

SW 30-009 - Hempstead Harbor. This area has been designated as a "Significant Coastal Fish and Wildlife Habitat" by the NYS Department of

State under Policy 7 of the Waterfront Revitalization and Coastal Resources Act of 1981. It is considered one of the 10 most important waterfowl wintering areas on the north shore of Long Island, most noted for scaup, canvasback and black ducks. In addition, the bay provides nursery and feeding habitat for striped bass, scaup, bluefish, Atlantic silverside, menhaden, winter flounder and blackfish.

Three Mile Radius

Rare Plants

Corydalis flavula - Yellow harlequin. This plant was last collected in 1907 in the vicinity of Manhasset Neck on the west side of Hempstead Harbor. It si listed as "S1" by the NY Natural Heritage Program.

Silene caroliniana va. pensylvanica - Wild pink. This plant was confirmed in 1986 in Locust Valley near Forest Avenue and Bayville Road. It is listed as "S3," rare in NY State, by the NY Natural Heritage Program.

Significant Habitats

SW 30-009 - (see description above)

SW 30-005 - Dosoris Pond and SW 30-006 - adjacent woodlands. Dosoris Pond is a relatively large, protected brackish pond, rare in Nassau County. The woodlands and wetlands surrounding the pond support several heron spp. as feeding and occasionally breeding habitat.

SW 30-011 - Estate lands south and east of Glen Cove. This general area supports a variety of wildlife including several amphibians and wintering waterfowl concentrations. Spotted salamander, a State listed special concern species, has been reported from an area near Matinecock.

SW 30-013 - Glen Cove to Mill Neck Bay Waterfowl Area. This offshore area is most noted for wintering scaup, mallard, Canada geese and black ducks. More information concerning these sites may be available from the following sources:

Protected Significant Coastal Fish and Wildlife Habitats

SW 30-009 - Hempstead Harbor	Mr. Thomas F. Hart NYS DOS 162 Washington Avenue Albany, NY 12231 (518) 474-3642

Rare Plants

Dr. Steven Clemants
NY Natural Heritage Program
Wildlife Resources Center
Delmar, NY 12054
(518) 439-7488

or

Mr. Robert Zaremba
The Nature Conservancy
P.O. Box 72
Cold Spring Harbor, NY 11724
(516) 367-3225

Significant Habitats

Regional Wildlife Manager
NYS DEC
SUNY @ Stony Brook - Bldg. 40
Stony Brook, NY 11790
(516) 751-7900

Our files are continually growing as new habitats and occurrences of rare species and communities are discovered. In most cases, site-specific or comprehensive surveys for plant and animal occurrences have not been conducted. For these reasons, we can only provide data which has been assembled from our files. We cannot provide a definitive statement on the presence or absence of species, habitats or natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

If this project is still active one year from now we recommend that you contact us again so that we may update this response.

Requests for data from the New York Natural Heritage Program and the Significant Habitat Program are now being consolidated. When requesting information from our files please include a brief description of the proposed project and a photocopy of the appropriate topographic quadrangle(s) with the site or sites identified. All requests should be addressed as follows:

ATTN: Information Services
Significant Habitat Unit
NYS Dept. of Environmental Conservation
Wildlife Resources Center
Delmar, NY 12054-9767

Our phone number is (518)439-7486. Please make a note of these changes.

If we can be of further assistance please do not hesitate to contact us.

Sincerely,

John W. Ozard

John W. Ozard
Senior Wildlife Biologist
Significant Habitat Unit

cc: H. Knoch
T. Hart
S. Clemants
R. Zaremba

JWO:sjs

REFERENCE NO. 24

[WH FRL 2511-2]

Aquifers Underlying Kings and Queens Counties, New York Determination

AGENCY: Environmental Protection Agency, Region II.

ACTION: Notice of determination: aquifers underlying Kings and Queens Counties, New York.

SUMMARY: Notice is hereby given that pursuant to section 1424(e) of the Safe Drinking Water Act (Pub. L. 93-523) the Administrator of the Environmental Protection Agency has determined that the aquifer underlying Kings and Queens Counties, New York, is the sole or principal source of drinking water for the southeastern portion of Queens County, New York, and which, if contaminated, would create a significant hazard to public health.

ADDRESS: The data on which these findings are based are available to the public and may be inspected during normal business hours at the U.S. Environmental Protection Agency, Water Supply Branch, 26 Federal Plaza, New York, New York 10278.

FOR FURTHER INFORMATION CONTACT: Damian J. Duda, U.S. Environmental Protection Agency, Water Supply Branch, 26 Federal Plaza, New York, New York 10278—Tel. (212) 264-1800.

SUPPLEMENTARY INFORMATION: The Safe Drinking Water Act was enacted on

104069

December 16, 1974. Section 1424(e) of the Act states:

If the Administrator determines, on his own initiative or upon petition, that an area has an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health, he shall publish notice of the determination in the Federal Register. After the publication of any notice, no commitment for Federal financial assistance (through a grant, contract, loan guarantee or otherwise) may be entered into for any project which the Administrator determines may contaminate such aquifer through a recharge zone so as to create a significant hazard to public health but a commitment for Federal financial assistance may, if authorized under another provision of law, be entered into to plan or design the project to assure that it will not so contaminate the aquifer.

Background

On June 18, 1979, the Jamaica Water Supply Company, Lake Success, New York, petitioned the Administrator to amend the Long Island (Nassua/Suffolk) designation of June 21, 1978, 43 FR 26611 to include the aquifers underlying Kings and Queens Counties, New York, as a sole source aquifer under the provisions of section 1424(e) of the Safe Drinking Water Act.

Public Participation

A notice of receipt of this petition, together with a request for comments was published in the Federal Register August 29, 1979, 44 FR 50649. In response to the Notice and request for comments, written comments were received from a State, and a local governmental agency. Both commenters claimed that the designation would be premature since there is an absence of final rules and regulations on the sole or principle source aquifer program under Section 1424(e). The letters further stated that New York State will be developing a ground-water management program and that the EPA should await the outcome of these studies before considering designation of the aquifer. The agency does not agree with the letters requesting further delay since the ground water management studies referred to are not directly related to the sole source designation request. In addition, EPA had sufficient information to write a background document which serves as the basis for designation.

On October 4, 1979, the Environmental Protection Agency (EPA) held a public hearing in Queens County, New York City, New York to hear the views of persons interested in the Kings and Queens Aquifer issue. Two groups presented testimony at the public hearing. The first group represented the petitioner, Jamaica Water Supply Company and the second represented the New York State Department of Health, Bureau of Public Water Supply. There were no representatives of the public present at the public hearing.

Basis for the determination

On the basis of the information which is available to this Agency the Administrator has made the following findings, which are the basis for the determination noted above:

(1) The Kings and Queens aquifers which underly the southeastern portion of Queens County are the sole or principal source of drinking water for approximately 650,000 people in such area, which is the service area of the Jamaica Water Supply Company. In 1979, the aquifers supplied approximately 60 million gallons per day (mgd) of water from 65 wells located in or near the water supply franchise area of the Jamaica Water Supply Company. Current water supply treatment practice for public supplies is generally limited to disinfection for drinking purposes. There is no alternative source of drinking water supply which could replace these aquifers if they were contaminated.

While the Kings and Queens aquifers are not utilized as the sole or principal source of drinking water for the Borough of Kings or for any other portion of Queens County, the geographic boundaries of Kings and Queens Counties are the recharge zone for the aquifers underlying the southeastern portion of Queens County. The recharge zone also encompasses parts of Nassau County, New York. Aquifers underlying Nassau and Suffolk Counties, New York have already been designated as a sole or principal source aquifer under Section 1424(e) of the Safe Drinking Water Act.

(2) The aquifers underlying Kings and Queens Counties are vulnerable to contamination through their recharge zone, particularly from leaking sewer pipes. Other sources such as past farming practices and present fertilization of lawns and gardens may also be significant. The area contains leaking fuel tanks and leachate from open dumps and improperly operated landfill sites all of which add to the contamination of the ground water. In addition, EPA analysis shows that further and continued withdrawal of water over and above the aquifers sustained yield would cause the salt-fresh water interface to move into the aquifers recharge zone thereby threatening the ground water quality by increasing the chloride content in the water. Since ground water contamination can be difficult or impossible to reverse, and because this aquifer is relied upon for drinking purposes by many people, contamination of the aquifer would pose a significant hazard to public health.

(3) When an aquifer has been designated as the sole or principal source of drinking water, the area in which projects may be reviewed is the area encompassed by: (1) the boundary of the designated aquifer's recharge zone, and (2) its stream-flow source zone.

The Administrator has determined that the recharge zone and stream-flow source zone for the aquifers underlying southeastern Queens County are defined by the outside boundary of Kings County (Borough of Brooklyn) and Queens County (Borough of Queens) in the city of New York and parts of Nassau County. Since the parts of Nassau County within the recharge and streamflow source zones of the aquifers underlying southeastern Queens County are already under sole or principal source protection as the result of the Agency's prior designation of the aquifers underlying Nassau/Suffolk Counties, today's designation will extend the area for project review to encompass projects undertaken in the Boroughs of Brooklyn and Queens in the city of New York.

Information Utilized in This Determination

The petition, written and verbal comments submitted by the public, a detailed map of the area and independent analysis by EPA are available to the public and may be inspected during normal business hours at the office of the Environmental Protection Agency, Region II, Water Supply Branch, 26 Federal Plaza, Room 24-130, New York, New York 10278.

A copy of the above documentation is also available at the U.S. Environmental Protection Agency, Waterside Mall, Public Information and Reference Unit, Room 2922, 401 M. Street SW., Washington, DC 20460.

Project Review

EPA proposed national regulations for implementing Section 1424(e) of the Safe Drinking Water Act on September 29, 1977, at 42 FR 51620. The proposed regulations contain procedures for review of Federal financially assisted projects which could contaminate "sole or principal source" aquifers through the recharge zone so as to create a significant hazard to public health. They are being used as interim guidance until promulgation of final regulations. Questions and comments concerning the possible effect of the regulations on

Federally assisted projects in the designated Kings/Queens Aquifer should be directed to the Water Supply Branch, U.S. Environmental Protection Agency, Region II, 26 Federal Plaza, New York, New York 10278.

EPA Region II is working with the Federal agencies, which may sponsor projects in the area of concern, to develop interagency procedures whereby EPA will be notified of proposed commitments for projects which could contaminate the designated aquifer. EPA will evaluate such projects and, where necessary, conduct an in-depth review, includng soliciting public comments where appropriate.

Although the project review process cannot be delegated, the Regional Administrator in Region II will rely, to the maximum extent possible, upon close coordination with State and local agencies to ensure consistency with their program objectives. Their in-put will be given full consideration and the Federal review process will function so as to complement and support State and local protection programs.

Federal funding may be withheld from any project which, upon review, may contaminate the aquifer through a recharge zone so as to create a significant hazard to public health.

Economic and Regulatory Impact

Pursuant to the provisions of the Regulatory Flexibility Act (RFA), 5 U.S.C. 605(b), I hereby certify that the attached rule will not have a significant impact on a substantial number of small entities. For purposes of this Certification the "small entity" shall have the same meaning as given in Section 601 of the RFA. This action is only applicable to the Kings-Queens Area.

The only affected entitites will be those area-based business, organizations or governmental jurisdictions that request Federal financial assistance for projects which have the potential for contaminating the aquifer so as to create a significant hazard to public health. EPA does not expect to be reviewing small isolated commitments of financial assistance on an individual basis, unless a cumulative impact on the aquifer is anticipated: accordingly, the number of affected small entities will be minimal.

For those small entities which are subject to review, the impact of today's action will not be significant. Most projects subject to this review will be preceded by a ground water impact assessment required pursuant to other Federal laws, such as the National Environmental Policy Act, as amended (NEPA), 42 U.S.C. 4321, et seq. Integration of those related review procedures with sole source aquifer review will allow EPA and other Federal agencies to avoid delay or duplication of effort in approving financial assistance, thus minimizing any adverse effect on those small entities which are affected. Finally, today's action does not prevent grants of Federal financial assistance which may be available to any affected small entity in order to pay for the redesign of the project to assure protection of the aquifer.

Under Executive Order 12291, EPA must judge whether a regulation is "major" and therefore subject to the requirement of a Regulatory Impact Analysis. This regulation is not "major" because it will not have an annual effect of $100 million or more on the economy, will not cause any major increase in costs or prices, and will not have significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of United States enterprises to compete in domestic or export markets. Today's action only affects the designated area. It provides an additional review of ground water protection measures, incorporating State and local measures whenever possible, for only those projects which request Federal financial assistance. Accordingly, a Regulatory Impact Analysis will not be required.

Dated: January 12, 1983

William D. Ruckelshaus,

Administrator.

[FR Doc. 84-1886 Filed 1-23-84; 8:45 am]

BILLING CODE 6560-50-M

REFERENCE NO. 25

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

IN THE MATTER OF LI TUNGSTEN SITE Glen Cove Development Company, Respondent. Proceeding Under Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. § 9606(a)).	ADMINISTRATIVE ORDER ON CONSENT Index No. II CERCLA-90215

JURISDICTION

1. THIS ADMINISTRATIVE ORDER ON CONSENT ("Consent Order") IS ISSUED to the Glen Cove Development Company ("Respondent"), by the United States Environmental Protection Agency ("EPA") pursuant to the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. § 9606(a), which authority was delegated to the Administrator of EPA by Executive Order 12580, dated January 23, 1987, and duly redelegated to the Regional Administrator of EPA Region II. Notice of this Consent Order has been given to the New York State Department of Environmental Conservation ("NYSDEC"), as required by Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

2. Respondent agrees to undertake all actions required by the terms and conditions of this Consent Order, including, but not limited to, the Scope of Work ("Appendix A") and the Compliance Schedule ("Appendix B") which are attached hereto and incorporated herein.

3. Respondent agrees not to contest the authority or jurisdiction of the Regional Administrator to issue this Consent Order and also agrees not to contest the terms of this Consent Order in any action to enforce its provisions.

4. This Consent Order shall apply to and be binding upon Respondent, as well as its agents, officers, directors, officials, contractors, receivers, trustees, successors and assigns.

DEFINITIONS

5: Unless otherwise defined herein, terms used in this Consent Order that are defined in Section 101 of CERCLA, 42 U.S.C. § 9601, shall have the meanings ascribed to them therein.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

6. Respondent is a general partnership duly organized and existing under the laws of the State of New York and is owned by the Old Court Holdings Company and the Old Court Joint Ventures, Inc..

7. Respondent owns property, located at the intersections of Herbhill Road and Dickson Lane in the City of Glen Cove, Nassau County, New York, known as the Li Tungsten Corporation facility (hereinafter referred to as the "Facility" or the "Site").

8. The Facility includes approximately ten (10) buildings and is located in a commercial area within one quarter of a mile of a public recreation area and residential dwellings. The Facility is situated above a sole source aquifer and is bounded to the south by the Glen Cove Creek into which surface water run-off discharges. The Glen Cove Creek is a tidal creek of Glen Cove Harbor.

9. Between 1941 and June of 1985, raw ore and scrap metals were processed at the Facility to produce an enriched tungsten product.

10. From 1941 to 1972, the Facility was owned and operated by the Wah Chang Smelting and Refining Company of America, Inc. ("Wah Chang"). In 1972, Wah Chang formed a wholly owned subsidiary, known as the Li Tungsten Corporation. Wah Chang retained title to the property and leased the premises to the Li Tungsten Corporation which, in turn, operated the Facility.

11. In November of 1984, Respondent purchased the Facility and the Li Tungsten leasing arrangement from Wah Chang and continued the lease arrangement with the Li Tungsten Corporation. In June of 1985, the Li Tungsten Corporation ceased operations at the Facility and filed a voluntary petition for bankruptcy pursuant to Chapter 11 of the Bankruptcy Code. No manufacturing operations have been conducted at the Site since June of 1985.

12. Prior to the issuance of this Consent Order, Respondent, through its consultants, undertook the following measures at the Site:

a) an external inspection of fifty tanks at the Facility to determine whether they were secure against rupture or leakage;

b) the sampling, draining, and drumming for disposal of the contents of two tanks determined not to be secure;

c) the packing of identifiable laboratory contents at the Facility;

d) the over-packing and/or staging of 108 drums containing acids, organics, and waste oil to a secure area at the Site;

e) the inventory, sampling, and removal of pressurized gas cylinders;

f) the removal of approximately one tank truck of anhydrous ammonia from the Facility, and

g) the establishment of twenty-four hour security at the Facility.

13. On March 29, 1989, NYSDEC inspected the Site and conducted an initial survey of the conditions as they existed at the Site at that time. NYSDEC reported the presence of, among other things, (a) approximately one hundred (100) drums containing liquid chemicals which were tentatively identified as containing cyanide, acids, and alkalis, (b) numerous storage tanks containing unknown quantities of liquid chemicals, (c) approximately twenty-six (26) pressurized cylinders containing chemicals, and (d) approximately twelve (12) transformers, some of which are leaking and are suspected to contain polychlorinated biphenyls ("PCBs"). The survey also revealed elevated radiation levels, the source of which is believed to be radium, thorium, and uranium, which are associated with ore from certain sources and is present as a result of the tungsten refining and manufacturing process.

14. On April 14, 1989, NYSDEC formally requested that EPA undertake appropriate response action at the Site pursuant to CERCLA, at which time EPA also assumed the lead enforcement role with regard to response actions at the Site.

15. On April 16 and 26-28, 1989, EPA inspected the Facility and conducted a preliminary investigation. The investigation confirmed the conditions reported by NYSDEC and tentatively identified the contents of the drums, including hydrofluoric acid, nitric acid, hydrochloric acid, carbon tetrachloride, and perchloroethylene ("PCE"). A number of the

drums containing processed wastes and solids are badly corroded with portions of their contents deposited onto warehouse floors and the yard at the Facility.

16. The substances present at the Site can cause a variety of adverse human health effects with prolonged or direct exposure, including adverse effects on the central nervous system, the respiratory system, and the cardiovascular system.

17. The Facility constitutes a "facility" within the meaning of Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

18. Cyanide, hydrofluoric acid, nitric acid, hydrochloric acid, carbon tetrachloride, and PCE are hazardous substances, as that term is defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

19. Releases and/or threatened releases of hazardous substances have occurred at the Site, as that term "release" is defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22), in that, among other things, such substances have leaked, spilled, been abandoned and/or have been otherwise released into the environment. In addition, there is a threat of further releases at and from the Site.

20. Conditions present at the Site pose a threat to the public health or welfare or the environment, based on factors set forth at Section 300.65(b)(2) of the National Contingency Plan ("NCP"), 40 C.F.R. § 300.65(b)(2) (July 1, 1986), including, but not limited to, the following:

a) Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chain;

b) Actual or potential contamination of drinking water supplies or sensitive ecosystems;

c) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;

d) Other situations or factors which may pose threats to public health or welfare or the environment.

21. Respondent is a "person", as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21), and an owner and/or operator as defined in Section 101(20)(A), 42 U.S.C. § 9601(20)(A) of the Facility. Respondent is thus a responsible

party under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and is liable for all costs of response, plus interest, incurred by the United States Government.

22. Respondent has been given an opportunity to discuss with EPA the basis for issuance of this Consent Order and its terms. Respondent has prepared Appendices A and B, attached hereto, for the performance of a removal action at the Site.

23. Respondent does not, by signing this Consent Order, concede that the "Findings of Fact and Conclusions of Law" set forth herein are correct or complete. Nor does Respondent admit that it is in any way responsible for any contamination at the Site or in any way liable for future response action(s) at the Site or any costs attendant to such response action(s).

DETERMINATION

Based on the FINDINGS and CONCLUSIONS set forth above, EPA Region II has determined that the release or threatened release of one or more hazardous substances or pollutants or contaminants from the Facility may present an imminent and substantial endangerment to the public health or welfare or the environment within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

ORDER

Based on the foregoing FINDINGS, DETERMINATION, and the entirety of the Administrative Record, IT IS HEREBY ORDERED that, to protect the public health, welfare, and the environment, it is necessary that certain actions be taken to abate the conditions at the Site, and further, that Respondent shall undertake a response action at the Site in accordance with the requirements specified below. All activities set forth below shall be initiated and completed as soon as possible, even though maximum time periods for their completion are specified in Appendix B.

DESCRIPTION OF WORK

24. Respondent agrees to implement the work set forth in Appendix A within the time frames established in Appendix B, both of which are attached hereto and which include plans for the following:

a) providing continuing Site security;

b) containing and addressing materials exhibiting elevated radioactivity;

c) securing and disposing of laboratory chemicals;

d) inventory and removal of drums containing chemicals;

e) characterization of the tanks at the Site;

f) precautionary monitoring and selected sampling of asbestos at the Site;

g) sampling and analysis of sediments from the creek adjacent to the Facility;

h) inventory and characterization of transformers at the Site, and

i) clean-up of mercury spill within a building at the Site.

25. Appendices A and B attached hereto shall be deemed incorporated into and an enforceable part of this Consent Order.

26. EPA approval of all plans, reports, and other submittals required under the terms of this Consent Order shall constitute a finding that such submittals are deemed consistent with the NCP.

27. EPA shall make the final determination as to the sufficiency and/or acceptability of all work, as set forth in Appendix A, conducted under this Consent Order, including but not limited to each required submittal.

DESIGNATED COORDINATOR, ON-SCENE COORDINATOR, OTHER PERSONNEL

28. Within three (3) calendar days of the effective date of this Consent Order, Respondent shall select a coordinator, to be known as the Designated Coordinator, and submit the name, address, and telephone number of the Designated Coordinator to Charles Fitzsimmons, the EPA On-Scene Coordinator ("OSC") and Alison Hess, the EPA Enforcement Project Officer, as set forth in paragraph 35 of this Consent Order. The Designated Coordinator shall be responsible for the Respondent's oversight of implementation of this Consent Order. The OSC and the Enforcement Project Officer are the persons designated by EPA to be responsible for on-scene monitoring of actions and activities required pursuant to this Consent Order. All EPA correspondence to the Respondent shall be sent promptly, in writing, to the Designated Coordinator. EPA will notify the Designated Coordinator if there is a personnel change in either the OSC or Enforcement Project Officer position.

29. All activities required of Respondent under the

terms of this Consent Order shall be performed only by qualified persons possessing all necessary permits, licenses, and other authorizations required by federal, state, and local governments.

30. As appropriate during the course of implementation of the actions required of Respondent pursuant to the Consent Order, Respondent or its consultants or contractors, acting through the Designated Coordinator, may confer with the EPA concerning the required actions. Based upon new circumstances or new information not in the possession of the EPA on the date of issuance of this Consent Order, the Designated Coordinator may submit a request to EPA, in writing, as set forth in paragraph 35 of this Consent Order, for approval of a modification to Appendices A and B. If approved by EPA in writing, such modification shall be deemed incorporated into this Consent Order.

31. In the event of a significant change in conditions at the Site, the Designated Coordinator shall immediately notify the EPA Enforcement Project Officer, at (212) 264-6040, and the EPA OSC, at the following telephone numbers: (201) 321-6608 (during business hours), or (201) 548-8730 (after business hours). In the event that EPA determines that the activities performed pursuant to this Consent Order or any emergency circumstance occurring at the Site pose a threat to human life or health or the environment, EPA may direct Respondent to cease further implementation of any actions pursuant to this Consent Order or to take other and further actions reasonably necessary to abate the threat. This provision is not to be construed so as to limit any powers EPA may have under Section 300.65 of the NCP, 40 C.F.R. § 300.65, or any other applicable provision of the NCP, or under any other applicable law or regulation.

32. Respondent's activities under this Consent Order shall be performed within the time limits set forth in Appendix B unless performance is delayed by events which constitute force majeure. For purposes of this Consent Order, force majeure is defined as any event arising from circumstances which are beyond the control of Respondent and could not have been avoided by the exercise of due care. Financial considerations shall not be considered circumstances beyond the control of Respondent. When an event constituting force majeure occurs, Respondent shall be obligated to perform the affected activities within a time period which shall be extended for a period of time reasonably attributable to force majeure. Respondent shall notify the EPA in writing, in the manner set forth in paragraph 35 of this Consent Order, as soon as possible following Respondent's awareness that circumstances constituting force majeure have occurred or are likely to occur. Failure by respondent to notify EPA in a timely manner shall constitute a waiver of its right to assert force majeure as a defense in any action brought by EPA to enforce the terms of this Consent Order. The burden of proving

that an event constituting force majeure has occurred shall rest with Respondent.

REPORTING REQUIREMENTS

33. All reports and other documents submitted by Respondent to EPA (other than the bi-monthly progress reports referred to in paragraph 34) which purport to document Respondent's compliance with the terms of this Consent Order shall be signed by a corporate officer of Respondent or the Designated Coordinator on behalf of Respondent.

34. Respondent shall provide bi-monthly written progress reports to the EPA Enforcement Project Officer and the OSC. Such reports shall fully describe all actions and activities undertaken and all validated sampling results obtained pursuant to this Consent Order since the prior report, as well as anticipated activities to be conducted at the Site during the next reporting period.

35. All submittals and notifications to EPA pursuant to this Consent Order shall be made in writing, with one copy sent to the OSC:

Charles Fitzsimmons - Li Tungsten OSC
Response and Prevention Branch
U.S. Environmental Protection Agency
Woodbridge Avenue
Edison, NJ 08837
(201) 321-6608

and two copies sent to the Enforcement Project Officer:

Carole Petersen, Chief
New York/Caribbean Compliance Branch
Emergency and Remedial Response Division
U.S. EPA, Region II
Room 737
26 Federal Plaza
New York, NY 10278
Attn: Alison Hess
Enforcement Project Officer
(212) 264-6040

All notices required to be given to Respondent pursuant to the terms of this Consent Order shall be sent to the Designated Coordinator, with one copy to the following addressees:

Debra Rothberg, Esq.
Jones, Day, Reavis & Pogue
599 Lexington Avenue
New York, NY 10022

Glen Cove Development Company
34 Market Place, Suite 301
Baltimore, MD 21202

Attn: Li Tungsten

ACCESS AND AVAILABILITY OF DATA

36. Respondent shall in no way hinder full and unimpeded access to the Site or any structure at the Site by EPA and NYSDEC, as well as their respective representatives, agents, employees, contractors and consultants. Respondent shall not prohibit such persons from being present at the Site at any and all times and from observing any and all activities conducted pursuant to this Consent Order. If Respondent is unable to obtain access to any portion of the Site, Respondent shall make its best effort to obtain access to any such portion of the Site prior to requesting that EPA assist in obtaining such access.

37. In accordance with applicable law, EPA and NYSDEC shall have full access to all records, including, but not limited to, contractual documents maintained or created by Respondent or its contractors or consultants in connection with implementation of the work under this Consent Order (except for records which are propoerly asserted as attorney work product or attorney/ client privilege). In addition, all data, information, and records created or maintained in connection with implementation of the work under this Consent Order shall, upon request, be available to EPA without delay, and all persons, including employees and contractors, who engage in activity under this Consent Order shall be available to and shall cooperate with the United States and/or EPA in providing such sources of information.

38. Respondent agrees to preserve, during the pendency of this Consent Order and for a minimum of eight (8) years after its termination, all records and documents in its possession or in the possession of its employees, agents, or contractors which in any way relate to the Site, despite any internal document retention policy to the contrary. After this eight year period, Respondent shall notify EPA at least thirty (30) calendar days prior to the destruction of any such documents. Upon request by EPA, Respondent shall make available to EPA such records or copies of any such records (except for records which are properly asserted as attorney work product or attorney/client privilege). Additionally, if EPA requests that some or all documents be preserved for a longer period of time, Respondent shall either comply with that request or provide the originals or copies, if such originals are not available, of the requested documents to EPA.

39. Respondent agrees not to conduct any response action at the Site, except those specifically referenced in Appendix A, without receiving written approval in advance by EPA.

40. Upon request by the EPA, Respondent shall provide split samples of any material sampled in connection with implementation of this Consent Order.

GENERAL PROVISIONS

41. All actions and activities carried out by Respondent pursuant to this Consent Order shall be done in accordance with all applicable federal, state, and local laws, regulations, and requirements and with CERCLA, the NCP, and any amendments thereto which may become effective prior to the date of EPA certification of completion, as set forth in paragraph 57, infra.

42. Any waste disposal conducted by Respondent pursuant to this Consent Order shall comply with all requirements of CERCLA, 42 U.S.C. §§ 9601-9675, including Section 121(d)(3), 42 U.S.C. § 9621(d)(3), RCRA, 42 U.S.C. §§ 6901-6991, the Toxic Substances Control Act ("TSCA"), 15 U.S.C. §§ 2601-2654, and all regulations and guidance promulgated pursuant thereto.

43. EPA shall be notified, in the manner set forth in paragraph 35 of this Consent Order, of the selection of any waste treatment, storage, or disposal facilities to be utilized for waste disposal conducted pursuant to this Consent Order at least five (5) days prior to off-site shipment of such wastes.

44. In the event that, for any reason, off-site treatment or disposal facilities are not available at the time Respondent may require such facilities for the completion of tasks required under this Consent Order, Respondent shall arrange, subject to EPA approval, for an authorized facility to store these wastes until such disposal or treatment facilities are available.

45. All sampling and analyses performed pursuant to this Consent Order shall conform to EPA Quality Assurance/Quality Control (QA/QC) and Chain of Custody procedures as set forth in Appendix A to this Consent Order.

46. All records produced by Respondent and delivered to the EPA in the course of implementing this Consent Order shall be available to the public unless identified as confidential by Respondent pursuant to 40 C.F.R. Part 2, Subpart B, and determined by EPA to merit confidential treatment, in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and applicable regulations.

47. Neither EPA nor the United States, by issuance of this Consent Order, assumes any liability for any acts or

omissions by Respondent, or Respondent's employees, agents, contractors or consultants in carrying out any action or activity pursuant to this Consent Order, nor shall EPA or the United States be held as a party to any contract entered into by Respondent, Respondent's officers, employees, agents, contractors or consultants in carrying out any action or activity pursuant to this Consent Order.

48. Nothing contained in this Consent Order shall affect Respondent's right to seek and obtain contribution or indemnification from other parties potentially liable for conditions which exist at the Site, except as limited by the rights reserved to EPA under Section 113 of CERCLA, 42 U.S.C. § 9613.

49. Nothing contained in this Consent Order shall affect any right, claim, interest, defense, or cause of action of any party hereto with respect to third parties.

50. EPA reserves the right to pursue third parties within its enforcement discretion for response actions and or cost recovery in connection with the Site.

51. Respondent agrees to reimburse EPA for all response costs incurred by the U.S. Government prior to the issuance and during the performance of the Consent Order. EPA shall transmit to Respondent periodic accountings of all such response costs with a narrative of the activities for which the costs were incurred. The response costs shall include those incurred by EPA, or by a contractor selected by EPA, with respect to work conducted by Respondent associated with the actions undertaken pursuant to this Consent Order. Within ten (10) business days of receipt of an accounting, Respondent will remit a check for the amount of those costs, made payable to the Hazardous Substance Superfund. Checks should specifically reference the identity of the Superfund site and the index number of this Consent Order. Payment should be sent to:

U.S. Environmental Protection Agency - Region II
Superfund Accounting
P.O. Box 360188M
Pittsburgh, PA 15251

A letter of explanation shall accompany the payment; a copy of the letter shall be sent to the Chief, New York/Caribbean Compliance Branch (whose address appears in paragraph 35 of this Consent Order).

52. Nothing herein shall constitute or be construed as a satisfaction or release from liability for Respondent, or Respondent's agents, contractors, lessees, receivers, successors or assigns with respect to any conditions or claims arising as a

result of past, current, or future operations, ownership, use of the Site, or disposal at the Site of hazardous substances. Respondent also agrees to indemnify and hold harmless EPA and the United States Government, its agencies, departments, agents, and employees for all claims, causes of action, damages, and costs of any type or description by third parties for any injuries or damages to persons or property resulting from acts or omissions of Respondent or its officers, directors, officials, receivers, trustees, successors, or assigns in carrying out any activities at the Site.

53. Nothing in this Consent Order constitutes a decision on pre-authorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2). Furthermore, Respondent agrees that it will not petition for reimbursement under Section 106(b) of CERCLA, 42 U.S.C. § 9606(b), for the performance of any actions required under this Consent Order.

ENFORCEMENT

54. Failure of Respondent to satisfy any terms of this Consent Order completely and expeditiously may result in EPA taking the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604.

55. If Respondent fails, without prior EPA approval, to comply with any of the requirements or deadlines set forth in this Consent Order, Respondent shall each make payments to the EPA in the amount indicated below for each day of non-compliance:

Days After Required Date	Stipulated Penalties
11 to 20 days	$1000.00
21 to 30 days	$3000.00
31 to 45 days	$5000.00

Any such penalty shall accrue as of the sixth day after the applicable deadline has passed and shall be due and payable ten days following receipt of the written demand from EPA or, if no such demand is received, on the thirtieth day following the date the penalty begins to accrue and shall be due and payable every thirtieth day thereafter. Payment of any such penalty to the EPA shall be made to EPA by certified check in accordance with paragraph 51 of this Consent Order. After forty-five consecutive days of non-compliance, EPA reserves the right to pursue civil penalties up to $25,000 per day pursuant to Section 106(b) of CERCLA, 42 U.S.C. § 9606(b), in lieu of these stipulated penalties.

56. Violation of this Consent Order as a result of Respondent's failure to comply with any provision herein, including but not limited to any failure to comply with Appendices A and B, attached hereto, shall be enforceable pursuant to Sections 106(b) and 113(b) of CERCLA, 42 U.S.C.

§§ 9606(b) and 9613(b). Respondent may also be subject to an action for cost recovery, civil penalties of up to $25,000 per day of violation of this Consent Order, and/or punitive damages (including treble damages), as provided in Sections 107(a), 106(b), and 107(c)(3) of CERCLA, 42 U.S.C. §§ 9607(a), 9606(b), and 9607(c)(3), respectively, for failure to comply with the terms of this Consent Order. Nothing herein shall preclude EPA from taking any additional enforcement actions, and/or other actions as it may deem necessary for any purpose, including the prevention or abatement of an imminent and substantial danger to the public health, welfare, or the environment arising from conditions at the Site, and recovery of the costs thereof.

Termination and Satisfaction

57. The provisions of this Consent Order shall be deemed satisfied upon receipt by Respondent of written certification from EPA that Respondent has demonstrated that all of the terms of this Consent Order, including, but not limited to, Appendices A and B, have been completed in accordance with the terms hereof to the satisfaction of EPA.

58. When Respondent concludes that it has completed the work required under the terms of this Consent Order, Respondent shall so notify EPA by submitting documentation demonstrating that it has complied with and completed the implementation of this Consent Order. That documentation shall further include a certification statement, signed by a responsible corporate officer of Respondent, which states the following:

> "I certify that the information contained in or accompanying this submission is true, accurate, and complete.
>
> "As to (the) (those) identified portions(s) of this submission for which I cannot personally verify (its) (their) truth and accuracy, I certify, as the company official having supervisory responsibility for the person(s) who, acting under my direct instructions, made the verification that the information is true, accurate, and complete."

Following receipt of the aforementioned documentation, and if EPA determines that the work required has been carried out in accordance with the terms of this Consent Order, EPA will notify Respondent to that effect, in writing, as set forth in paragraph 57.

59. This Consent Order shall be effective on the date of receipt of an executed copy by Counsel for Respondent. All times for performance of activities required herein will be calculated from the effective date.

U.S. ENVIRONMENTAL PROTECTION AGENCY

James R. Marshall for

WILLIAM J. MUSZYNSKI, P.E.
Acting Regional Administrator
U.S. Environmental Protection Agency
Region II

7/21/89

Date of Issuance

APPENDIX A

SCOPE OF WORK

INTERIM ACTIONS
AT THE
LI TUNGSTEN SITE
63 HERB HILL ROAD
GLEN COVE, NEW YORK

Prepared by:

FRED C. HART ASSOCIATES, INC.
530 FIFTH AVENUE
NEW YORK, NEW YORK 10036-5166

July 17, 1989

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1.0 INTRODUCTION

The Li Tungsten facility (herein after referred to as the "Site") is located at 63 Herb Hill Road, Glen Cove, New York. The Site is 26 acres and consists of three separate parcels. The main operations at the Site were conducted on the parcel bordered by Glen Cove Creek to the south and Herb Hill Road to the north and a second parcel to the west of Dickson Lane. The parcel bordered by Herb Hill Road on the south and Dickson Lane on the west contains no facility structures. A map of the Site is provided in Figure 1.

Based on documents in the possession of the Glen Cove Development Company (GCDC) and obtained from records maintained at the Site the following background information was developed. The Site was operated from the 1940's to approximately 1985 by the Wah Chang Trading Company and its wholly owned subsidiary the Li Tungsten Corporation. The operation involved the processing of ore and scrap tungsten concentrates to ammonium paratungstate (APT) and subsequently formulating APT to metal tungsten powder and tungsten carbide powder. Other specialty products such as tungsten carbide powder plus cobalt and other material for plasma spraying; tungsten titanaium carbide powder; tantalum carbide powder; tungsten spray powder; crystalline tungsten powder; and, molybdenum spray powder were also produced.

The property was acquired by GCDC in 1984 and leased to The Li Tungsten Corporation. The market for tungsten was apparently depressed by the 1980's and operations at the Li Tungsten facility had slowed by this time. The Li Tungsten operation declared bankruptcy in 1985.

GCDC is a New York State general partnership jointly owned by Old Court Joint Ventures, Inc. and Old Court Holdings Corporation, Inc., both of which in turn are wholly-owned subsidiaries of Old Court Savings and Loan, Inc. (in Receivership) located in Maryland.

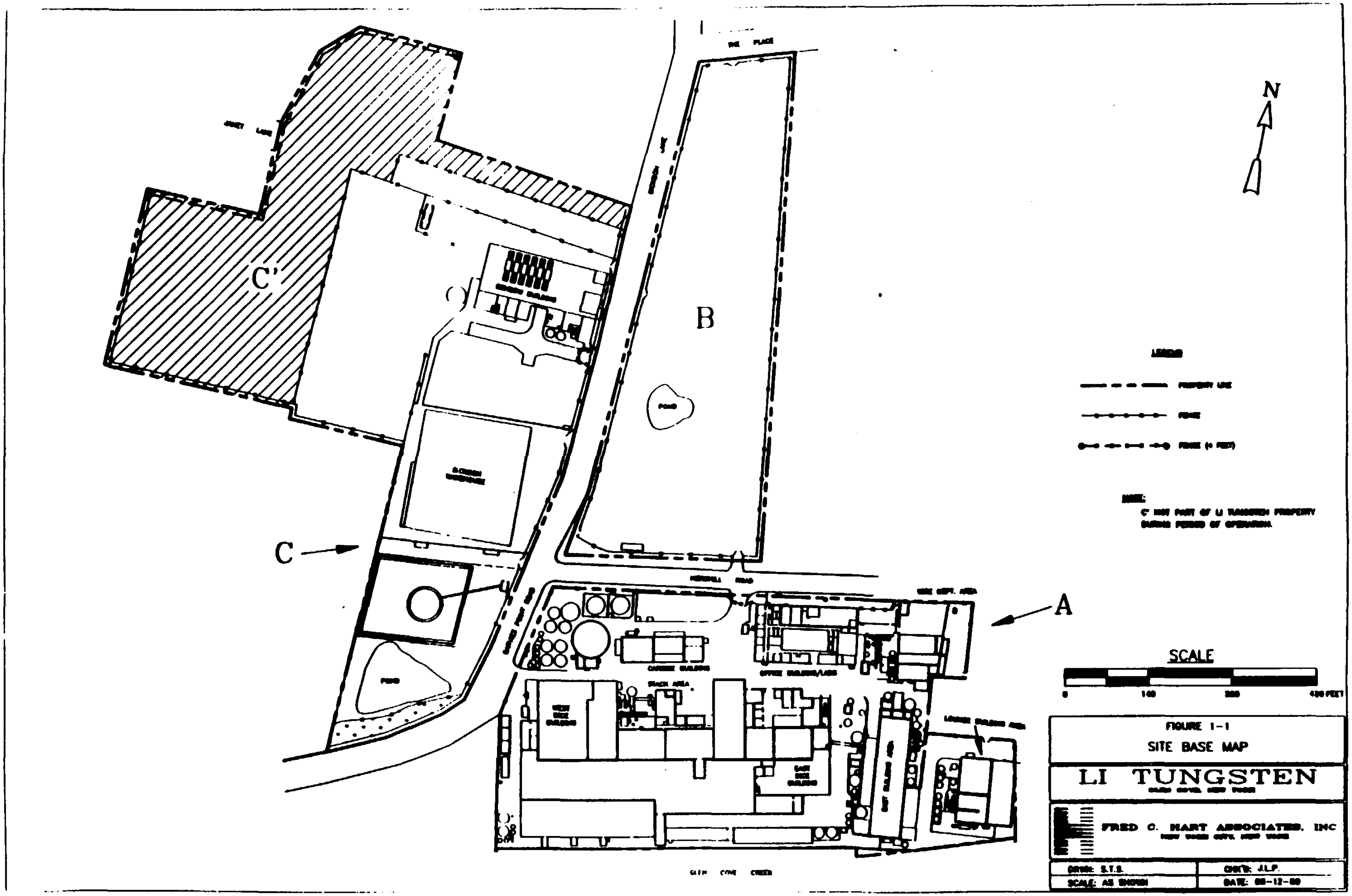

Figure 1

Tungsten Facility

Fred C. Hart Associates, Inc. (HART) was retained by GCDC to coordinate implementation of interim actions to address certain environmental conditions at the Site. This scope of work (SOW) sets forth those proposed interim actions which were identified by the United States Environmental Protection Agency (USEPA) Region II pursuant to its authority under The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. Section 9601 et. seq. This scope of work is prepared as an attachment to the USEPA Administrative Order on Consent, Index No. II CERCLA-90215. The work proposed in this document will be consistent with practices described in:

"Characterization of Hazardous Waste Sites". NTIS PB87-120291, August 1985.

"Guidance Document for Clean-up of Surface Tank and Drum Sites". NTIS PB87-110672, May 1985.

"Drum Handling Practice at Hazardous Waste Sites". NTIS PB86-165362 OSHA, January 1986.

"29 CFR 1910.120 OSHA Regulations."

"EPA Standard Operating Safety Guidelines". OSWER 10/88.

All sampling and analyses performed by respondent shall conform to the USEPA quality assurance/quality control (QA/QC) and chain of custody procedures and in conformance with the USEPA publication entitled, Test Methods for Evaluating Solid Waste (SW-846 November 1986 as updated) and the USEPA document entitled, Guidance for Preparation of Combined Work/QA Project Plan for Environmental Monitoring (OAMS 005/80).

2.0 PURPOSE

This SOW outlines plans for interim actions at the Site. These interim actions were identified by the USEPA because of concerns regarding the stability and security of the Site. GCDC proposes to undertake interim actions identified in this document pursuant to the aforementioned administrative order.

As stated during previous discussions with the USEPA, GCDC, through the Receivership, must comply with strict guidelines regarding the allocation of funds. To obtain approval for funding for one or more items, a fairly accurate cost estimate or range is required. The Circuit Court in Baltimore monitoring the Receivership must authorize expenditure of any funds. As a result, an order must be signed by the Circuit Court in Baltimore to formally allocate the funds to complete these interim actions. The court is expected to issue this order by June 12, 1989. GCDC through the receivership has obtained approval for a few of these items and has completed or is in the process of completing some of these actions.

3.0 INTERIM ACTIONS

The following interim actions were discussed at two meetings with the USEPA. Those interim actions which have already been completed (i.e. MEKP and cylinder removal) are not discussed or included on the schedule. The remaining interim actions and the plans for implementation are discussed in the following sections. A schedule for completion of these actions is also included.

3.1 Site Security

Based upon the USEPA reconnaissance of the Site, security was identified to be a major concern. Because of damage to the perimeter fence or the absence of a fence in some areas, access to the Site could not be controlled. Although one 24 hour guard is stationed and periodically patrols in a marked car outside the boundary of the Site, the USEPA believes that certain areas may not be readily accessible to a lone security patrol (northwestern boundary of the Site parcel just west of Dickson Lane). Therefore EPA requested that in addition to GCDC proceeding with fencing, the security patrol at the Site be upgraded.

3.1.1 Proposed Action. GCDC is proceeding with securing the Site perimeter with fencing. A priority will be given to installing a line of fence to impede access along the northwestern perimeter of the parcel located west of Dickson Lane. As of this date, all repairs have been made to the existing fence and gates. The fence posts along the northwestern parcel have been installed. Fencing in this area and between Chemco and the Site parcel north of Herb Hill Road is expected to be completed by June 23, 1989. Furthermore, GCDC has placed another security guard in a marked vehicle for the 8-hour shift from approximately 4:00 p.m. to midnight. This guard is stationed along the Site perimeter on Dickson Lane. A security presence in this area, for the period of time proposed, is intended to dissuade trespassers from entering the northwest Site parcel. During the course of implementing one or more of the interim actions, workers will be on-site during the day and it is less likely that unauthorized individuals will trespass. As certain interim actions are completed, (i.e. fencing completion etc.) GCDC would like the opportunity to downgrade the security force. Funds which do not have to be expended on guards can be targeted for additional stabilization and/or removal actions.

3.2 Radioactive Materials

USEPA has recommended the collection, staging and subsequent removal of isolated drums or containers of residual ore or slag that has exhibited elevated radioactivity readings. These drums or containers have been identified via preliminary radiological surveys conducted by Nassau County Department of Health (NCDOH) and listed in their status reports. The USEPA also did some preliminary radiological surveying and will provide maps depicting the location of the containers it identified to the extent it differs from those items in the NCDOH report.

3.2.1 Proposed Action. The NDL Organization has been contracted to undertake a comprehensive, real-time radiological survey both inside and outside the Site buildings. The purpose of this survey would be to identify any areas where on-site worker access needs to be restricted as a result of radioactivity levels and/or any special protective measures to be taken while working in those areas. Since worker access to many areas of the Site will be required to complete other interim actions or future remedial work, this radiological survey is prudent and necessary. With the USEPA approval, this survey will include:

1) a gamma ray survey of the property and buildings on an approximate 25 foot x 25 foot grid;

2) Fixed and removable alpha radiation survey of buildings;

3) Collection and gamma spectral analysis of process material (and mud pond sediments;

4) Preparation of report summarizing the findings of the survey.

During the course of this radiological survey, readily accessible drums or containers which exhibit elevated readings will be moved to an agreed upon on-site location to which access can be restricted. Based on the results of the survey, up to fifteen (15) containers (including the ones previously identified at the Site) which are characterized as low level radioactive waste will be removed for disposal.

3.3 Laboratory Chemicals

Small quantities of identifiable laboratory chemicals have already been secured and placed in overpacks. In addition, small quantities of unidentified laboratory chemicals remain in some areas. USEPA has recommended characterization, overpacking and disposal, as needed, for all the laboratory chemicals.

3.3.1 Proposed Action. The existing laboratory overpacks will be removed for disposal. The chemicals in existing overpacks may have to be redistributed and placed in special containers. All existing laboratory overpacks which can be removed, as is, by ENSCO (the contractor who completed the overpacking) to its disposal facility will be done. Any remaining laboratory overpacks will be repackaged and reinventoried by the selected disposal contractor. Any packing lists in compliance with the contractors packing guidelines will be spot checked for accuracy. The existing laboratory overpacks will be moved to a fully permitted transfer facility to await approval of the disposal site. The remaining unindentified laboratory chemicals will be characterized in the field. Up to 200 additional bottles, jars and/or containers will undergo a fingerprint analysis in an isolated area of the Site. This fingerprinting will be done under a portable fume hood. Based on these results, the chemicals will be appropriately packaged for off-site disposal.

3.4 Drum Inventory and Removal

USEPA has recommended the characterization and removal of drums containing chemicals (solid and liquid) at the Site. Specifically, USEPA referred to 50 to 100 units located in the Dickinson Warehouse area (northwest parcel).

3.4.1 Proposed Action. A number of drums containing liquids had been identified in the report prepared by RTP Environmental Associates, Inc. in May 1988. Based on the RTP report, approximately 108 drums of liquids were moved to inside the Dice Building (Main Facility Property). EPA's identification of 50 to 100 units (containers, drums, etc.) containing solid and liquids is in addition to the drums already placed in the Dice Building.

Based on this information, up to 250 drums of liquid/solid chemicals will be characterized for removal and disposal. The drummed contents will be screened for radioactivity in conjunction with the characterization for the purpose of bulking prior to detailed laboratory analysis for disposal. It is assumed that 125 drums will be characterized as waste water treatment candidates and 125 drums will be characterized as incineration candidates.

3.5 Tank Characterization

USEPA has recommended characterization of any liquids remaining in tanks at the Site. The purpose of this characterization would be to determine if the contents of any tank warrants immediate removal; to identify the types of materials present in different locations so that the appropriate emergency services units are aware of materials on-site; and, ultimately, to ascertain the most practical treatment and disposal options for these liquids.

3.5.1 Proposed Action. Currently, the only inventory of the tanks on the Site and their contents is in the RTP report. According to the report, this inventory was based on a review of records at the Site and a walk-through with a former employee of Li Tungsten. In many instances the tank size and contents (as of May 1988) is indicated. This information does not preclude the need for a more definitive characterization. To accomplish this, representative on-site testing for parameters, including but not limited to, RCRA characteristics, metals and screening for radioactive materials may be the most practical approach. A request for bid (RFB) for this characterization will be solicited (see schedule). The approach and methodology to be used for this characterization will be provided to the USEPA prior to implementation. The results of the characterization will serve to identify the nature of the materials in tanks, their location and evaluate further actions.

3.6 Asbestos

USEPA stated its concern with the presence of large quantities of asbestos in certain areas of the Site. These concerns previously involved worker exposure.

3.6.1 Proposed Action. An asbestos abatement/removal project is more consistent when a long-term remedial program is implemented at the Site. The major concern regarding asbestos is to on-site workers during field activities. Therefore, in order to protect workers, access to areas which are known to contain large quantities of friable asbestos (Lounge Building Area) will be limited. These areas will be designated on a Site map in the Health and Safety Plan. Additional protective gear will be used by personnel working in these areas. Consistent with OSHA requirements, HART will set up ambient air sampling for a specific time period in the vicinity of these areas to check whether fibers are being dispersed into the air stream. This work will be in addition to health and safety monitoring which will be implemented during the duration of on-site activities.

Two high volume air samples will be analyzed by phase contrast microscopy (PCM) to determine an eight hour time weighted average of asbestos concentration. PCM only determines the total number of fibers and does not distinguish between types of material. If OSHA standards are exceeded using PCM, another two air samples (taken at the same time) will be analyzed by transmission electron microscopy (TEM). In addition, between 25 to 50 bulk asbestos samples will be collected for analysis via polarized light microscopy with dispersion staining (PLMDS). Three to five samples will be collected of each homogeneous area and an estimate of the volume of material sampled, its percent asbestos, location and condition will be presented on a Site map.

3.7 Creek Sediment Sampling

USEPA has recommended that samples of sediment from the creek be obtained for analysis of appropriate radionuclides. The agency proposed these samples be obtained in the vicinity of the outfalls from the Site. According to available information, five (5) outfalls discharged from the Site to the creek when the facility operated. Therefore, five (5) sediment samples were requested.

3.7.1 Proposed Action. A creek sediment sampling program is premature and more in line with a long-term remedial study not a short, interim action. Nevertheless, five (5) creek sediment samples will be collected for radioactivity analysis only. The sampling and analysis will be done by personnel associated with New York University Medical Center, Institute of Environmental Medicine. The individuals will do the work as consultants to GCDC and not under the banner of the University. One sediment sample will be taken in the creek, east of the Site while three sediment samples will be collected in the vicinity of the outfalls and one sediment sample will be obtained from the western portion of the creek.

The samples will be placed in aluminum cans and assayed, (after one to two weeks), for gamma-emitting radionuclides (^{40}K, ^{137}Cs, ^{226}Ra-daughters, ^{228}Th-daughters and ^{228}Ra-daughters) using an intrinsic Ge detector. A portion of the sample will be removed and assayed radiochemically for ^{234}U, ^{238}U, ^{232}Th, ^{230}Th and ^{228}Th. Although the sample collection will be completed in a short period of time, the radionuclide analysis and report will require approximately 3 to 4 months.

3.8 Transformer Inventory and Characterization

USEPA has recommended the inventory of transformers at the Site and characterization of the oils inside the transformers. During its inspection, one transformer located outside a building on the main facility property appeared to have leaked onto the asphalt surface.

3.8.1 Proposed Action. HART has identified sixteen (16) transformers at the Site. The previous RTP report indicated twenty-one (21) transformers and two (2) oil circuit breakers. The contractor who completed the survey for RTP (Empire Environmental Services) will be contacted to account for these five (5) additional transformers and two (2) oil circuit breakers. In any event, a sample oil from the identified transformers will be collected for PCB analysis. Based on these analyses, arrangements for disposal and associated costs will be prepared.

3.9 Mercury Clean-up

An area inside the Benbow (Reduction) building was identified by the USEPA field reconnaisance team to have mercury on the floor. USEPA recommended this area be cleaned.

3.9.1 Proposed Action. Once the dimension of the area is defined, a field team in protective clothing will spread an absorbant lead based salt on the floor surface. The floor surface will be swept and the material placed in a plastic 55-gallon drum. All equipment used in the cleaning will also be placed in the drum. A representative sample (wipe or sweep) will be collected for mercury analysis after the clean-up is completed.

APPENDIX B

SCHEDULE OF COMPLIANCE

INTERIM ACTIONS
AT THE
LI TUNGSTEN SITE
63 HERB HILL ROAD
GLEN COVE, NEW YORK

Prepared by:

FRED C. HART ASSOCIATES, INC.
530 FIFTH AVENUE
NEW YORK, NEW YOPK 10036-5166

July 17, 1989

TABLE OF CONTENTS

List of Figures

1.0 ESTIMATED SCHEDULE

An estimated schedule for the implementation of the interim actions described in this SOW is presented in Figure 2. The time lines include mobilization, field activities and necessary laboratory analysis. Footnotes for each of the listed items are also included. Although the estimated schedule indicates that work will start once an interim order is established, a number of items are ongoing or have already been completed. To the extent practical, interim actions wil be completed in short time frames.

HART will provide a bi-monthly status report to the USEPA which summarizes the on-going or completed activities and transmits relevant documentation. The recipients of these status reports are indicated in the order on consent.

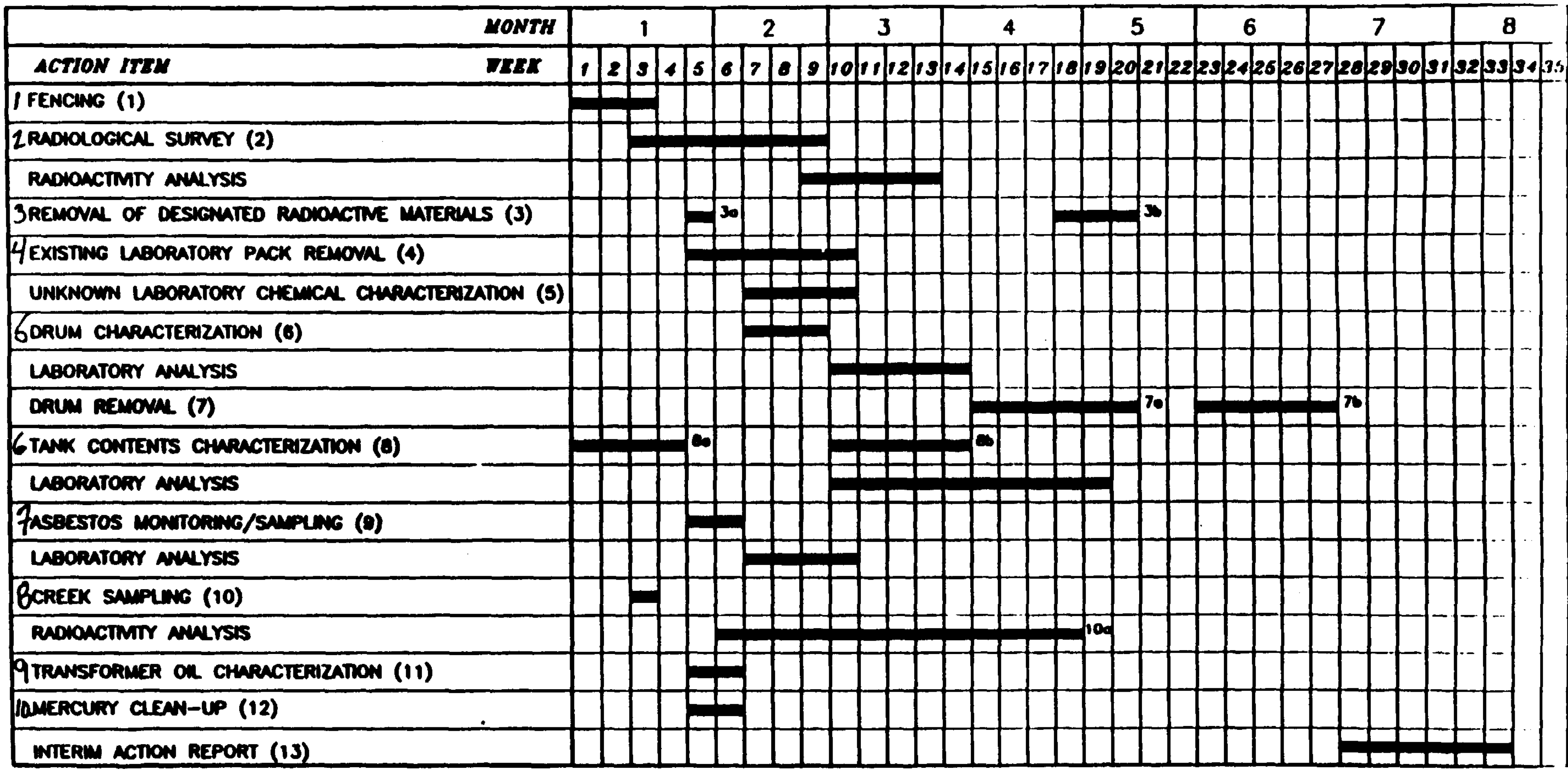

FIGURE 2

Estimated Schedule
Interim Actions at Li Tungsten

FRED C. HART ASSOCIATES, INC

Notes:

* Start date coincides with interim order

1: Fencing is ongoing. Estimated completion is June 23rd. Security guards (one 24 hr. and one 8 hr.) are also provided at the Site.

2: Radiological survey to be conducted by the NDL Organization. Currently scheduled to begin the week of June 19, 1989.

3: Previously identified containers exhibiting elevated radioactivity readings will be staged in the wire plant. Once survey is completed, up to fifteen containers, characterized as low level radioactivity waste, will be removed from the Site.

3a: This time line reflects the staging of containers exhibiting elevated radioactivity levels in the wire plant building.

3b: This time line reflects removal of up to fifteen containers characterized as low level radioactive waste once laboratory analysis and disposal site arrangements are completed.

4: Initiation of laboratory pack removal to immediately follow radiological survey time frame allows for mobilization, random checking of packing inventories against drum contents, repackaging if necessary, and removal to appropriate staging or disposal facility.

5: Unknown laboratory chemical characterizations will be completed in an isolated area using a fume hood.

6: Drum characterization assumes a total of 250 drums (125 for waste water treatment analysis and 125 for incineration analysis).

7: Drum removal (see 6) to begin following receipt of detailed laboratory analysis.

7a: Time frame to review laboratory results of drums and arranging for appropriate disposal of up to 250 drums.

7b: Time frame to remove up to 250 drums to an approved disposal facility.

8: Tank contents characterization includes identifying which tanks contain liquids and their approximate volumes.

8a: Time frame to soliciting competitive bids, review and select contractor and notify USEPA prior to implementation.

8b: Time frame to complete the tank characterization.

9: Time frame, to monitor/sample for asbestos. Includes two high volume air samples and between 25 and 50 bulk samples for laboratory analysis.

10: Creek Sampling will be scheduled.

10a: Radionuclide analysis and reporting to be completed in approximately 3 months

11: Characterization of transformer oils to follow radiological survey.

12: Mercury on floor of Benbow Building to be cleaned.

13: Summary Report of completed Interim Actions.

REFERENCE NO. 26

530 Fifth Avenue, New York, NY 10036-5166 (212) 840-3990

Fred C. Hart Associates, Inc.

HART

New York, NY
Albany, NY
Boston, MA
Cherry Hill, NJ
Detroit, MI
Hartford, CT
Irvine, CA
Jacksonville, FL
Liberty Corner, NJ
Pittsburgh, PA
Sacramento, CA
Washington, DC
Houston, TX
West Chester, PA

September 21, 1989

Mr. Charles Fitzsimmons
Environmental Engineer-OSC
USEPA Region II
Woodbridge Avenue
Edison, New Jersey 08837

Re: Partial Laboratory Results of Air and Bulk Samples--Li Tungsten

Dear Mr. Fitzsimmons:

Enclosed are copies of the analytical results which have been received by HART. These include air samples for asbestos, metals and volatile organics from a number of indoor and outdoor sampling points at the Li Tungsten facility in Glen Cove.

The asbestos air results are contained on a single data sheet from Laboratory Testing Services These air samples were obtained from five locations, four of which were inside buildings. A summary sheet of the results of air samples for metals is attached to the laboratory date sheets. Also, a summary sheet for the air samples for volatile analysis is attached to the laboratory data sheets. These volatile air samples were obtained inside the laboratories on the main parcel (A). Where applicable, the TLV for a specific volatile compound is noted. The results of air samples for inorganic acid gases have not yet been received from the laboratory.

A total of 51 bulk samples were collected for analysis of asbestos containing materials. The results of this analysis including a description and map of the sample location is also in this package.

Sincerely,

James A. Perazzo
Associate-Manager of Geosciences

Asbestos Bulk Sampling Data - (06/26 - 06/27/89)

Number	Type	Analysis
ASB 1.	Trowelled on tank insulation	69% Chrysotile
ASB 2.	Black paper/fabric matrix behind ASB 1	5% Chrysotile
ASB 3.	Block material supported by wide mesh hanging from tank	45% Amosite
ASB 4.	Pipe insulation between tanks L9D and L9C	No asbestos detected (NAD)
ASB 5.	Pipe joint compounds on elbow (of ASB 4)	60% Chrysotile
ASB 6.	Floor dust (near APT)	NAD
ASB 7.	Stacked pipe insulation (preformed)	60% Amosite
ASB 8.	Hanging insulation on pipes (preformed)	60% Amosite
ASB 9.	Pipe insulation associated with Tank 85	30% Amosite 20% Chrysotile 2% Crocidolite
ASB 10.	Outside wall (block with flakes)	10% Chrysotile
ASB 11.	Wall board, 2nd level, northern section	NAD
ASB 12.	Trowelled on tank insulation above anhydrous tank	NAD
ASB 13.	Block material (same area as ASB 12)	NAD
ASB 14.	Wall material (east inner wall - along stairwell)	NAD
ASB 15.	Plasterboard from locker room - 2nd level	NAD
ASB 16.	Preformed block insulation, roof on locker room	20% Amosite 20% Chrysotile

Number	Type	Analysis
ASB 17.	White powder beneath overhead piping (same as ASB 16)	NAD
ASB 18.	Insulation on small furnace	25% Amosite 25% Chrysotile
ASB 19.	Plaster board particles - collapsed on floor	NAD
ASB 20.	Ceiling tile - collapsed on floor	NAD
ASB 21.	Pipe joint compound (1st lab from wire plant)	20% Amosite 35% Chrysotile 2% Crocidolite
ASB 22.	Solid insulation on pipe (same area as ASB 21)	30% Amosite 30% Chrysotile 15% Crocidolite
ASB 23.	Duplicate (of ASB 22)	25% Amosite 30% Chrysotile 5% Crocidolite
ASB 24.	Ceiling board (brown)	NAD
ASB 25.	Safe interior (insulation) debris on floor	NAD
ASB 26.	Pipe insulation in boiler room	25% Chrysotile
ASB 27.	Insulation debris fallen from overhead pipe rack	40% Amosite 15% Chrysotile
ASB 28.	Refractory cement spill on wet floor in machine shop	NAD
ASB 29.	Mineral wool (white boxes in machine shop)	NAD
ASB 30.	Pipe (overhead) insulation - preformed	35% Amosite 20% Chrysotile
ASB 31.	Outside coating on tank 35	30% Chrysotile
ASB 32.	Pipe (overhead) insulation between tank 35 and 36	NAD
ASB 33.	Refractory material on underside of furnace 105	NAD
ASB 34.	Refractory block - in drum, outside SW corner of Dice	<1% Amosite

(2173n-2)

Number	Type	Analysis
ASB 35.	Pipe insulation - dropped from overhead rack	<1% Chrysotile
ASB 36.	Wall board (just inside from stack)	NAD
ASB 37.	Insulation around flue coming out of stack area	80% Chrysotile 40% Amosite
ASB 38.	Troweled on cement (same as ASB 37)	45% Chrysotile
ASB 39.	Pipe insulation - inside boiler area	35% Amosite 20% Chrysotile
ASB 40.	Fibreboard, warehouse stack	NAD
ASB 41.	Refractory lining in furnace	NAD
ASB 42.	Pipe insulation stacked	40% Amosite 10% Chrysotile 5% Crocidolite
ASB 43.	Wall board - west wall	NAD
ASB 44.	Wall board - west wall	NAD
ASB 45.	Slag on floor	NAD
ASB 46.	Deteriorized wall board	NAD
ASB 47.	Deteriorized pipe insulation, fallen on ground - outside	NAD
ASB 48.	Pipe insulation in boiler room	30% Amosite 20% Chrysotile
ASB 49.	Corrugated fibreboard insulation on floor	2% Chrysotile
ASB 50.	Roof panel in corner office	NAD
ASB 51.	Preformed pipe insulation - white, on furnace	40% Amosite 30% Chrysotile

Applied
Environmental
Technology, Inc.

a subsidiary of WAVETECH inc.

316 Cooper Center
Pennsauken, N.J. 08109 (609) 486-9200

August 2, 1989

Hart Environmental
530 Fifth Avenue
New York, NY 10036

ATTEN: Karl Boldt

RE: Lab #: L070701
Project No. 00265-02-00035-01
Bulk Sample Analyses

Dear Mr. Boldt:

Applied Environmental Technology, Inc., located at 316 Cooper Center, Pennsauken, New Jersey, analyzed the following samples on June 29, 1989

DATA SUMMARY
BULK SAMPLE ANALYSIS

Sample No.	Sample Description	Approximate Percentage Asbestos Composition
1-8766-47	Trowled on tank Insulation	69% Chrysotile
2-8766-48	Black outer cover on tank	05% Chrysotile
3-8766-49	Insulation block on tank	45% Amosite
4-8766-50	Corrugated pipe insulation	No Asbestos Detected (NAD)
5-8766-51	Pipe joint	60% Chrysotile
6-8766-52	Floor dust	(NAD)
7-8766-53	Loose pipe insulation (pre-formed)	60% Amosite
8-8766-54	White (pre-formed) pipe insulation	60% Chrysotile

Applied Environmental Technology, Inc.

Sample No.	Sample Description	Approximate Percentage Asbestos Composition
9-8766-55	White (pre-formed) block insulation	30% Amosite 20% Chrysotile 02% Crocidolite
10-8766-56	Asphalt wall coating	10% Chrysotile
11-8766-57	Wallboard	(NAD)
12-8766-58	Trowled on tank insulation	(NAD)
13-8766-59	(Pre-formed) block insulation	(NAD)
14-8766-60	Wall plaster	(NAD)
15-8766-61	Plaster board	(NAD)
16-8766-62	(Pre-formed) block insulation	20% Amosite 20% Chrysotile
17-8766-63	Fallen white debris	(NAD)
18-8766-64	Furnace insulation	25% Amosite 25% Chrysotile
19-8766-65	Plaster board	(NAD)
20-8766-66	Ceiling tile	(NAD)
21-8766-67	Pipe insulation	20% Amosite 35% Chrysotile 02% Crocidolite
22-8766-68	Pipe insulation	30% Amosite 30% Chrysotile 15% Crocidolite
23-8766-69	Pipe insulation	25% Amosite 30% Chrysotile 05% Crocidolite

Applied Environmental Technology, Inc.

Sample No.	Sample Description	Approximate Percentage Asbestos Composition
24-8766-70	Cellulose wallboard	(NAD)
25-8766-71	Safe insulation	(NAD)
26-8766-72	Pipe insulation	25% Chrysotile
27-8766-73	Fallen white debris	40% Amosite 15% Chrysotile
28-8766-74	Refractory cement	(NAD)
29-8766-75	Mineral wool	(NAD)
30-8766-76	White (pre-formed) pipe insulation	35% Amosite 20% Chrysotile
31-8766-77	Tank coating	30% Chrysotile
32-8766-78	Pipe insulation	(NAD)
33-8766-79	Refractory	(NAD)
34-8766-80	Refractory debris	<1% Amosite
35-8766-81	Fallen debris (HH)	<1% Chrysotile
36-8766-82	Wall board	(NAD)
37-8766-83	White (pre-formed) insulation	20% Chrysotile 40% Amosite
38-8766-84	Trowled on cement	45% Chrysotile
39-8766-85	Pipe insulation	35% Amosite 20% Chrysotile
40-8766-86	Fiber board	(NAD)
41-8766-87	Refractory	(NAD)

Applied Environmental Technology, Inc.

Sample No.	Sample Description	Approximate Percentage Asbestos Composition
42-8766-88	White (pre-formed) insulation	40% Amosite 10% Chrysotile 05% Crocidolite
43-8766-89	Wall board	(NAD)
44-8766-90	Wall board	(NAD)
45-8766-91	Slag	(NAD)
46-8766-92	Deteriorated wall board	(NAD)
47-8766-93	Deteriorated insulation	(NAD)
48-8766-94	White (pre-formed) pipe insulation	30% Amosite 20% Chrysotile
49-8766-95	Corrugated pipe insulation	02% Chrysotile
50-8766-96	Roof panel	(NAD)
51-8766-97	White (pre-formed) pipe insulation	40% Amosite 30% Chrysotile

Applied Environmental Technology, Inc.

ANALYTICAL TECHNIQUES

Analyses of bulk samples are performed according to Environmental Protection Agency Interim Method 600/M4-82-020. Each bulk sample undergoes both a gross examination under low power magnification to establish the presence and percentage of fibrous and non- fibrous components, and an examination under high power magnification to provide positive identification of these fibrous and some non-fibrous components.

The first examination is performed with a stereo microscope and an external illuminator. Each bulk sample is emptied onto a weighing paper and examined for layering, homogeneity and the presence of fibrous and non-fibrous materials. An estimation of the percentage of each component relative to the whole sample is made.

The second examination is performed with a polarizing light microscope (PLM). A sub-sample of the bulk sample is selected at the conclusion of the first examination, mounted onto a slide, treated with a fluid having an appropriate index of refraction, and examined using the PLM. The polarizing light microscopy procedure identifies the characteristics of the sub-sample components with transmitted polarizing light, crossed polars, slightly uncrossed polars, crossed polars plus the first order red compensator, and the central stop dispersion staining objective. The observations obtained using the various techniques are used to identify fibrous and some non-fibrous components on the basis of morphology, sign of elongation, and refractive index/dispersion staining colors.

QUALITY CONTROL

The Industrial Hygiene Services Laboratory conducts general quality control procedures as recommended by the National Institute for Occupational Safety and Health, the Environmental Protection Agency and the American Industrial Hygiene Association.

Additionally, the laboratory is a successful participant in both the American Industrial Hygiene Association/National Institute for Occupational Safety and Health Proficiency Analytical Testing (PAT) Program (Identification Number 08104-001), and the Environmental Protection Agency/Research Triangle Park Bulk Asbestos Quality Assurance Program (Identification Number 2180).

Joseph Mandrino,
Managing Director

D.C. No.: E 0200

HART

Name: KARL BOLDT
Affiliation: F.C. HART ASSOC.
Phone: (212) 840-3990
Address: 530 FIFTH AVE, NEW YORK, NY 10036
Client/Job No: 00265-02 00035-01
Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
ASB 1	8766-47	6/26/89	1150	BULK	1	TROWELED-ON TANK INS.
ASB 2	876648	↓	↓	↓	↓	BLK. OUTER COVER ON TANK
ASB 3	876649	↓	↓	↓	↓	INS. BLOCK ON TANK
ASB 4	876650	↓	↓	↓	↓	CORRUGATED PIPE INS.
ASB 5	8766-51	↓	↓	↓	↓	PIPE JOINT INS.
ASB 6	8766-52	↓	↓	↓	↓	FLOOR DUST
ASB 7	8766-53	↓	↓	↓	↓	LOOSE PIPE INS. (PRE-FORMED
ASB 8	8766-54	↓	↓	↓	↓	WHITE PRE FORMED PIPE INS
ASB 9	8766-55	↓	↓	↓	↓	WHITE PRE-FORMED BLOCK INS.
ASB 10	8766-56	↓	↓	↓	↓	ASPHALT WALL COATING

Comments: ALL SAMPLES ANALYZED FOR ASBESTOS (PLM)

Relinquished by: Karl Boldt Date: 6/28/89 Shipment Method: FED EXP
Time: 5 PM Airbill No.: 9643707070

Received by: [signature] Date: 6-29-89 Relinquished by: ______ Date: ______
Time: 9:45 Am Time: ______

Received by: ______ Date: ______ Relinquished by: ______ Date: ______
Time: ______ Time: ______

Final Disposition of Samples: ______

Received by: ______ Date: ______ Time: ______

HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

D.C. No.: E 0201

HART

Name: KARL BOLDT
Affiliation: F.C. HART ASSOC.
Phone: (212) 840-3990
Address: 530 FIFTH AVE., NEW YORK, NY 10036
Client/Job No: 00265-02-00035-01
Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
ASB 11	8766-57	6/26/89	1233	BULK	1	WALLBOARD
ASB 12	8766-58	↓	↓	↓	↓	TROWELED-ON TANK INS.
ASB 13	8766-59					PRE-FORMED BLOCK INS.
ASB 14	8766-60					WALL PLASTER
ASB 15	8766-61					PLASTER BOARD
ASB 16	8766-62					PRE-FORMED BLOCK INS.
ASB 17	8766-63					FALLEN WHITE DEBRIS
ASB 18	8766-64					FURNACE INS.
ASB 19	8766-65					PLASTER BOARD
ASB 20	8766-66	↓	↓	↓	↓	~~[illegible]~~ CEILING TILE

Comments: ALL SAMPLES ANALYZED FOR ASBESTOS

Relinquished by: Karl Boldt Date: 6/28/89 Shipment Method: FED EXP
Time: 5 PM Airbill No.: 9643704070

Received by: [signature] Date: 6-29-89 Relinquished by: ______ Date: ______
Time: 9:45AM Time: ______

Received by: ______ Date: ______ Relinquished by: ______ Date: ______
Time: ______ Time: ______

Final Disposition of Samples: ______

Received by: ______ Date: ______ Time: ______

HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

104116

D.C. No.: E 0202

HART

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Phone: (212) 840-3990
Address: 530 FIFTH AVE, NEW YORK, NY 10036
Client/Job No: 00265-02-00035-01
Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
ASB 21	8766-67	6/26/89	1350	BULK	1	PIPE INS.
ASB 22	8766-68					PIPE INS.
ASB 23	8766-69					PIPE INS.
ASB 24	8766-70					CELLULOSE WALLBOARD
ASB 25	8766-71		1612			SAFE INS.
ASB 26	8766-72					PIPE INS.
ASB 27	8766-73					FALLEN WHITE DEBRIS
ASB 28	8766-74					REFRACTORY CEMENT
ASB 29	8766-75					MINERAL WOOL
ASB 30	8766-76		1050			WHITE PRE-FORMED PIPE INS.

Comments: ALL SAMPLES ANALYZED FOR ASBESTOS

Relinquished by: Karl Boldt Date: 6/28/89 Shipment Method: FED EXP
Time: 5 PM Airbill No.: 9643704070

Received by: [signature] Date: 6-29-89 Relinquished by: ______ Date: ______
Time: 9:45 Am Time: ______

Received by: ______ Date: ______ Relinquished by: ______ Date: ______
Time: ______ Time: ______

Final Disposition of Samples: ______

Received by: ______ Date: ______ Time: ______

HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

104117

D.C. No.: E 0203

HART

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Address: 530 FIFTH AVE., NEW YORK, NY 10036
Client/Job No: 00265-02-00035-01
Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
ASB 31	8766-77	6/26/89	1650	BULK	1	TANK COATING
ASB 32	8766-78					PIPE INS. (FG)
ASB 33	8766-79					REFRACTORY
ASB 34	8766-80					REFRACTORY DEBRIS
ASB 35	8766-81					FALLEN DEBRIS (HH)
ASB 36	8766-82		1745			WALLBOARD
ASB 37	8766-83					WHITE PRE-FORMED INS ~~FALLEN DEBRIS (HH)~~
ASB 38	8766-84					TROWELED-ON CEMENT
ASB 39	8766-85					PIPE INS.
ASB 40	8766-86	6/27/89	1004			FIBERBOARD

Comments: ALL SAMPLES ANALYZED FOR ASBESTOS

Relinquished by: Karl Boldt Date: 6/28/89 Shipment Method: FED EXP
Time: 5 PM Airbill No.: 9643704070

Received by: [signature] Date: 6-29-89 Relinquished by: ___ Date: ___
Time: 9:45 AM Time: ___

Received by: ___ Date: ___ Relinquished by: ___ Date: ___
Time: ___ Time: ___

Final Disposition of Samples: ___

Received by: ___ Date: ___ Time: ___

HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

104118

D.C. No.: E 0204

HART

Name: KARL BOLDT
Affiliation: F.C. HART ASSOC.
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Address: 530 FIFTH AVE., NEW YORK, NY 10036
Client/Job No: 00265-02-00035-01
Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
ASB 41	8766-87	6/27/89	1008	BULK	1	REFRACTORY
ASB 42	8766-88					WHITE PRE-FORMED INS.
ASB 43	8766-89					WALLBOARD
ASB 44	8766-90					WALLBOARD
ASB 45	8766-91					SLAG
ASB 46	8766-92					DETERIORATED WALL BOARD
ASB 47	8766-93					DETERIORATED INS.
ASB 48	8766-94		1045			WHITE PRE-FORMED PIPE INS.
ASB 49	8766-95					CORRUGATED PIPE INS.
ASB 50	8766-96					ROOF PANEL

Comments: ALL SAMPLES ANALYZED FOR ASBESTOS

Relinquished by: Karl Boldt Date: 6/28/89 Shipment Method: FED EXP
Time: 5PM Airbill No.: 9643704070

Received by: [signature] Date: 6-29-89 Relinquished by: ____ Date: ____
Time: 9:45Am Time: ____

Received by: ____ Date: ____ Relinquished by: ____ Date: ____
Time: ____ Time: ____

Final Disposition of Samples: ____

Received by: ____ Date: ____ Time: ____

HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

D.C. No.: E 0205

HART

Name: KARL BOLDT

Affiliation: F. C. HART ASSOC.

Phone: (212) 840-3790

Address: 530 FIFTH AVE., NEW YORK, NY 10036

Client/Job No: 00265-02-00035-01

Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
ASB 57	8766-97	6/27/89	1112	BULK	1	WHITE PRE-FORMED PIPE INS.

Comments: ALL SAMPLES ANALYZED FOR ASBESTOS

Relinquished by: Karl Boldt Date: 6/28/89 Shipment Method: FED EXP
Time: 5PM Airbill No.: 7643704070

Received by: Steve W[illegible] Date: 6-29-89 Relinquished by: ____ Date: ____
Time: 9:45am Time: ____

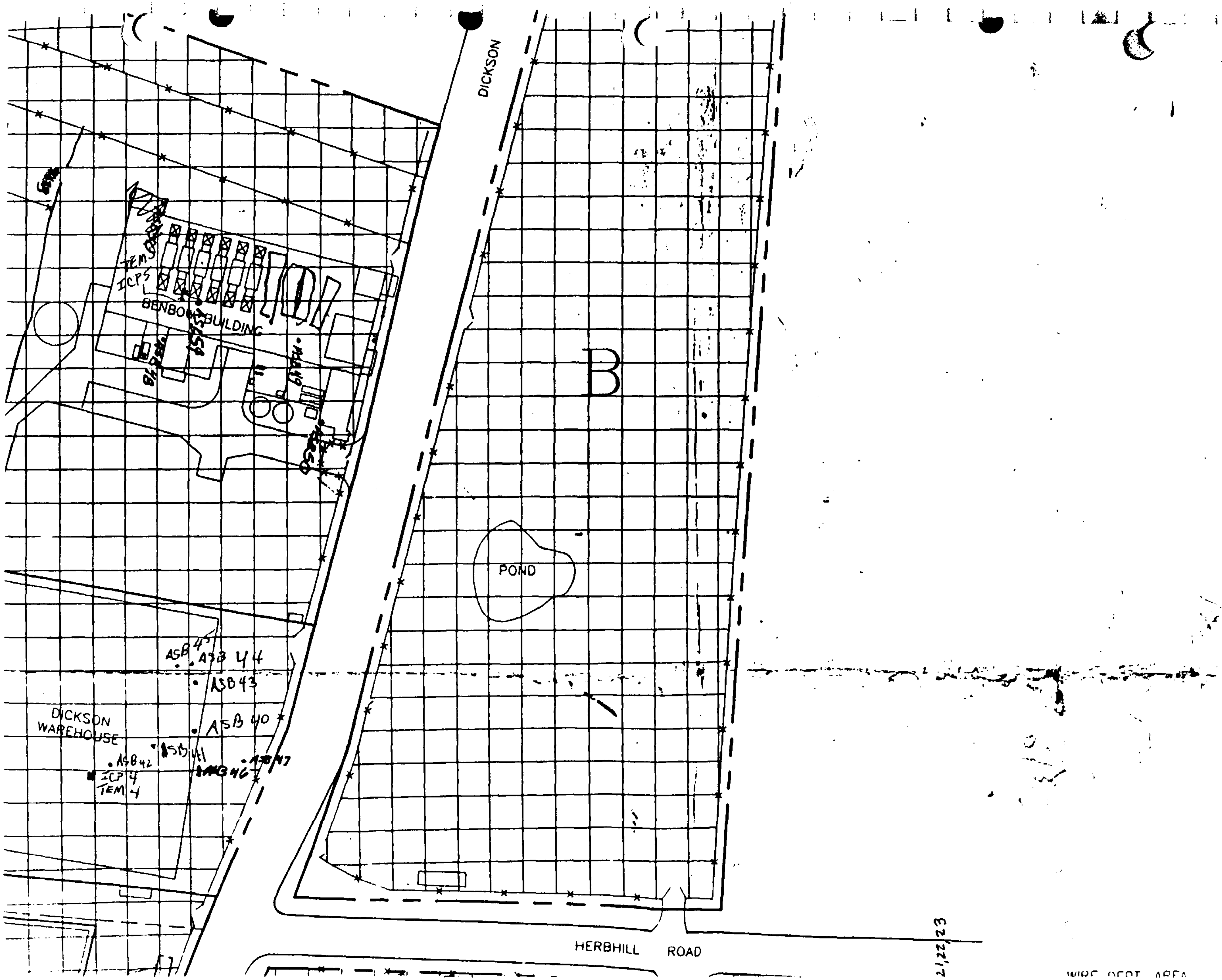
Received by: ____ Date: ____ Relinquished by: ____ Date: ____
Time: ____ Time: ____

Final Disposition of Samples: ____

Received by: ____ Date: ____ Time: ____

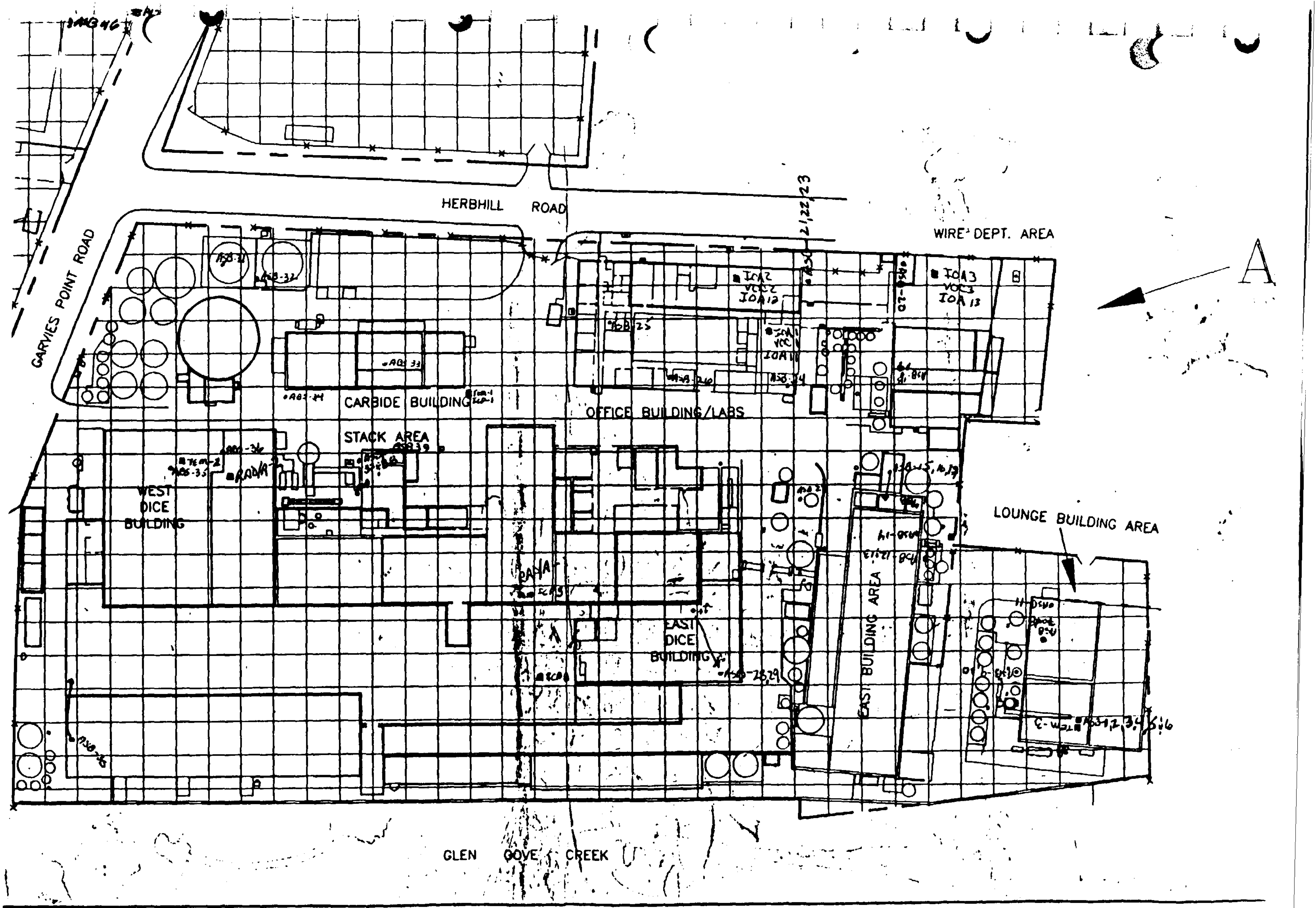
HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

104120



DICKSON
BENBOW BUILDING
TEM 5
ICP 5
B
POND
ASB 45
ASB 44
ASB 43
ASB 40
DICKSON WAREHOUSE
ASB 41
ASB 42
ASB 47
ASB 46
ICP 4
TEM 4
HERBHILL ROAD

104121


HERBHILL ROAD
GARVIES POINT ROAD
WIRE DEPT. AREA
A
CARBIDE BUILDING
OFFICE BUILDING/LABS
STACK AREA
WEST DICE BUILDING
EAST DICE BUILDING
EAST BUILDING AREA
LOUNGE BUILDING AREA
GLEN COVE CREEK

104122

VOC CONCENTRATION SUMMARY

	ug/sample (ug/m^3)			
	VOC-2 Lab NW	VOC-3 Lab E	VOC-4 Blank	ACGIH TLV
Chloromethane	<1.0	<1.0	<1.0	
Bromomethane	<1.0	<1.0	<1.0	
Vinyl chloride	<1.0	<1.0	<1.0	
Chloroethane	<1.0	<1.0	<1.0	
Methylene chloride	0.6B(5.7B)	0.6 (5.9)	2.6	(175,000)
Acetone	<1.0	<1.0	<1.0	
Carbon disulfide	<0.5	<0.5	<0.5	
1,1-Dichloroethene	<0.5	<0.5	<0.5	
1,1-Dichloroethane	<0.5	<0.5	<0.5	
Total-1,2-Dichloroethene	<0.5	<0.5	<0.5	
Chloroform	<0.5	0.2J(2.0J)	0.3J	(50,000)
1,2-Dichloroethane	<0.5	<0.5	<0.5	
2-Butanone	<1.0	<1.0	<1.0	
1,1,1-Trichloroethane	<0.5	0.3J(2.9J)	0.3J	(1,900,000)
Carbon tetrachloride	<0.5	0.1J(1.0J)	0.2J	(30,000)
Vinyl acetate	<0.1	<0.1	<0.1	
Bromodichloromethane	<0.5	<0.5	<0.5	
1,1,2,2-Tetrachloroethane	<0.5	<0.5	<0.5	
1,2-Dichloropropane	<0.5	<0.5	<0.5	
Trans-1,3-Dichloropropene	<0.5	<0.5	<0.5	
Trichloroethene	<0.5	<0.5	<0.5	
Benzene	<0.5	<0.5	<0.5	
cis-1,3-Dichloropropene	<0.5	<0.5	<0.5	
2-Chloroethylvinylether	<1.0	<1.0	<1.0	
Bromoform	<0.5	<0.5	<0.5	
2-Hexanone	<1.0	<1.0	<1.0	
4-Methyl-2-Pentanone	<1.0	<1.0	<1.0	
Tetrachloroethene	<0.5	<0.5	<0.5	
Toluene	<0.5	<0.5	<0.5	
Chlorobenzene	<0.5	<0.5	<0.5	
Ethylbenzene	<0.5	<0.5	<0.5	
Styrene	<0.5	<0.5	<0.5	
Total Xylenes	<0.5	<0.5	<0.5	
Total Dichlorobenzene	<3.0	<3.0	<3.0	

B - also found in lab blank
J - estimated value

laboratory Testing Services

RESULTS - continued:

TEM RESULTS SUMMARY FORM

PROJECT NAME: 00265-02-00035-01 DATE: July 7, 1989

CLIENT: Fred C. Hart Associates PROJECT NO.:

ATTENTION: Karl Boldt LAB. NO.: 89-02534

SAMPLING AGENCY: Fred C. Hart Associates

SAMPLING SITE: Li Tungsten, Glen Cove, New York

SAMPLING DATE: June 26, 1989-June 27, 1989 NO. OF SAMPLES SUBMITTED: Five (5)

RESULTS:

Sample	LTS ID#	Sample Volume (liters)	Sensitivity (Structures/cm^3)	Filter Concentration (Structures/mm^2)	Air Concentration (Structures/cm^3)
01	T-00304	1170	0.0047	<14.29	<0.0047
02	T-00305	936	0.0049	<11.90	<0.0049
03	T-00306	1058	0.0047	12.99	0.0047
04	T-00307	933	0.0049	<11.90	<0.0049
05	T-00308	904	0.0051	11.90	0.0051

104124

< = LESS THAN
Transmission electron microscopy analysis was conducted in accordance with the analytical procedures described in 40 CFR Part 763 appendix A to subpart E.

Edward R. W. Smith
ANALYST(S)

Mark Young Ph.D.
MARK YOUNG
TEM DIRECTOR

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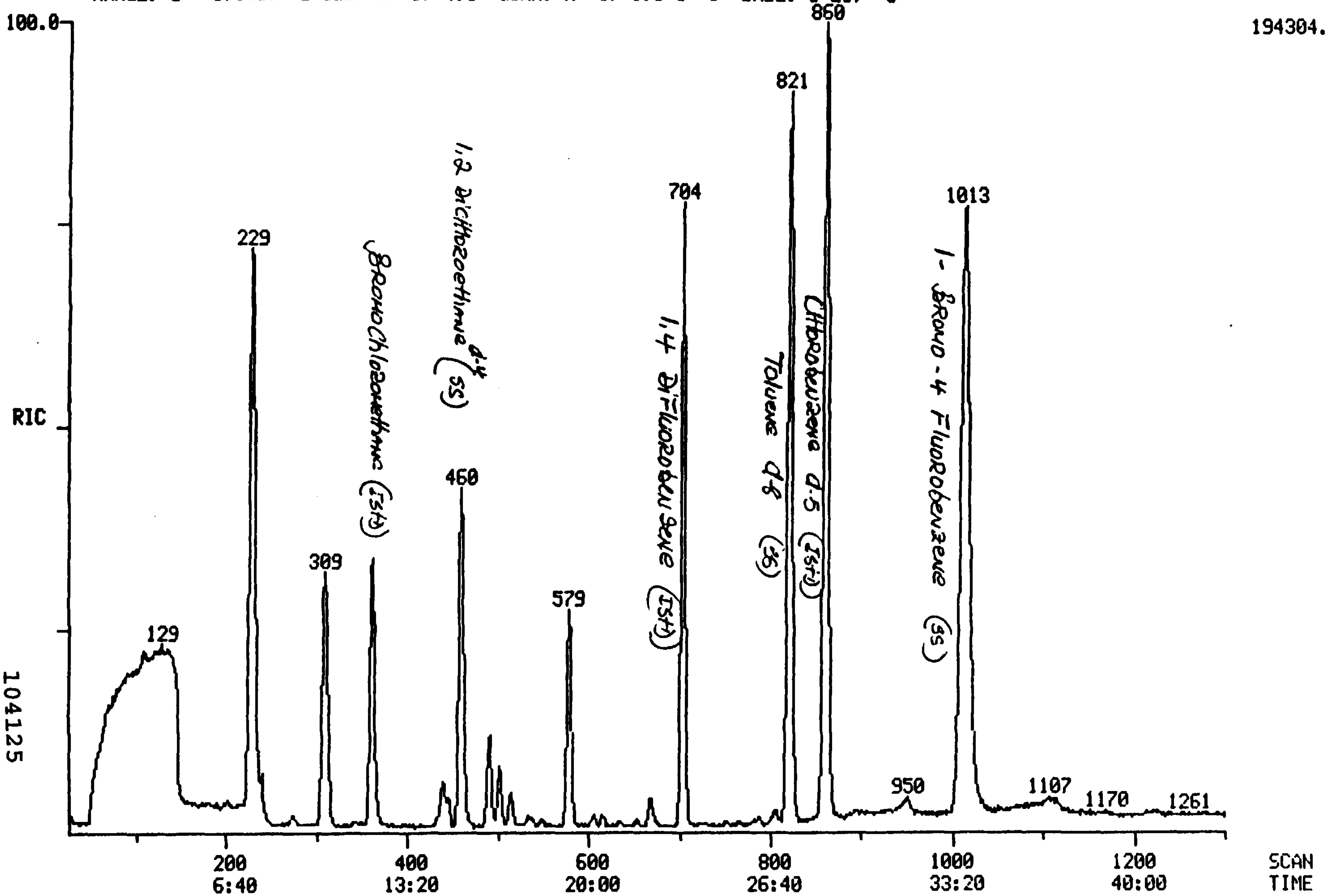
0/14/89 12:46:00
DATA: D8947 #101 SCANS 25 TO 1300
CALI: D8947 #2
SAMPLE: FRED C.HART,VOC-4/N9-9560,REC'D 7/7/89,LOGIN 1874
CONDS.: TUBE/2MLS,100UL/5ML INSTD
RANGE: G 1,1300 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



104125

J.C. No.: E 0221

HART

Name: KARL BOLDT
Affiliation: ~~HART~~ ~~EAST~~ FRED C. HART ASSOC., INC.
Phone: 530 FIFTH AVE. (212) 840-3990
Address: NEW YORK NY 10036
Client/Job No: 00265-02-00003-01
Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
IOA-2		7/7/89	4 PM	SORBENT TUBE	1	INORGANIC ACIDS NIOSH METHOD 7300
IOA-3						
IOA-4						
VOC-2						VOCs NEI METHOD
VOC-3						
VOC-4						

Comments:

Relinquished by: Karl Boldt Date: 7/7/89 Shipment Method: By Hand
Time: 5 PM Airbill No.:

Received by: [illegible signature] Date: 7/7/89 Relinquished by: Date:
Time: 5 PM Time:

Received by: Date: Relinquished by: Date:
Time: Time:

Final Disposition of Samples:

Received by: Date: Time:

HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

104126

Laboratory Testing Services

LAB. NO.: 89-02534

REPORT OF TRANSMISSION ELECTRON
MICROSCOPY TESTS
FOR

AIRBORNE ASBESTOS FIBER DETERMINATION
FOR

F.C. HART ASSOCIATES

530 5th STREET
NEW YORK, NEW YORK 10036

JULY 7, 1989

75 URBAN AVENUE, WESTBURY, NEW YORK 11590 • (516) 334-7770 • (800) 433-0008 • FAX NO. 516-334-7720

laboratory Testing Services

LAB. NO.: 89-02534

CLIENT:	Fred C. Hart Associates 530 5th Street New York, New York 10036 Attention: Karl Boldt
MATERIAL:	Room Air
CLIENT'S ORDER NO.:	20663
TEST FOR:	Detection and Identification of suspected Asbestos in Five (5) air samples as determined by Transmission Electron Microscopy (TEM) with Selected Area Electron Diffraction (SAED) and Energy Dispersive X-Ray Microanalysis (EDX).

1.0 BACKGROUND:

F.C. Hart Associates, Inc. collected five (5) air samples for airborne asbestos fiber determination at Li Tungsten, Glen Cove, New York. The samples were received on June 19, 1989.

2.0 PROCEDURE:

Transmission Electron Microscopy (TEM) with Selected Area Electron Diffraction (SAED) and Energy Dispersive X-Ray Microanalysis (EDX) were employed to detect and identify suspected asbestos in the above referenced air samples. The analytical method was conducted in accordance with analytical procedures described in 40 CFR Part 763 Appendix A to Subpart E.

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LAB. NO.: 89-02534

3.0 APPLICABLE QUALIFICATIONS:

Laboratory Testing Services, Inc. maintains an interim accreditation for Transmission Electron Microscopy by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP Identification #10837).

Laboratory Testing Services, Inc. is an American Industrial Hygiene Association accredited (#333) laboratory.

4.0 RESULTS:

Enclosed are an electron micrograph, selected area electron diffraction pattern, and elemental composition report of a representative chrysotile and non-asbestos structure.

The following results were obtained:

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laboratory Testing Services

RESULTS - continued:

TEM RESULTS SUMMARY FORM

PROJECT NAME: 00265-02-00035-01

DATE: July 7, 1989

CLIENT: Fred C. Hart Associates

PROJECT NO.:

ATTENTION: Karl Boldt

LAB. NO.: 89-02534

SAMPLING AGENCY: Fred C. Hart Associates

SAMPLING SITE: Li Tungsten, Glen Cove, New York

SAMPLING DATE: June 26, 1989-June 27, 1989

NO. OF SAMPLES SUBMITTED: Five (5)

RESULTS:

Sample	LTS ID#	Sample Volume (liters)	Sensitivity (Structures/cm^3)	Filter Concentration (Structures/mm^2)	Air Concentration (Structures/cm^3)
01	T-00304	1170	0.0047	<14.29	<0.0047
02	T-00305	936	0.0049	<11.90	<0.0049
03	T-00306	1058	0.0047	12.99	0.0047
04	T-00307	933	0.0049	<11.90	<0.0049
05	T-00308	904	0.0051	11.90	0.0051

< = LESS THAN

Transmission electron microscopy analysis was conducted in accordance with the analytical procedures described in 40 CFR Part 763 appendix A to subpart E.

Edward R D [illegible]
ANALYST(S)

Mark Young Ph.D.
MARK YOUNG
TEM DIRECTOR

104130

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LAB. NO.: 89-02534

5.0 DISCUSSION OF RESULTS:

The Occupational Safety and Health Administration (OSHA) has established standards for airborne asbestos fiber concentrations in an occupational environment. The permissible exposure level (PEL) based on an eight hour Time Weighted Average (TWA) is 0.2 fibers per cubic centimeter (f/cc) of air. According to the standard, the employer shall ensure that no employee is exposed to an airborne asbestos fiber concentration above the PEL.

Additionally, OSHA has established a TWA action level of 0.1 asbestos f/cc. Asbestos air concentrations at or above the action level require the employer initiate procedures to peridically monitor employee exposure.

New York State has established an air concentration of 0.01 f/cc as an acceptable clearance level for post abatement air quality. In "Guidance for Controlling Asbestos-Containing Materials in Buildings" as measured by Transmission Electron Microscopy (TEM), 0.005 f/cc has been referenced as a typical outdoor ambient airborne asbestos concentration in urban areas (Chatfield, 1983). It would be impractical to expect indoor air asbestos concentrations to be less than outdoor concentrations. Therefore, outdoor levels would appear to be the most appropriate baseline for comparison to indoor concentrations.

It must be noted that air monitoring measures only current conditions and provides no information about fiber release potential and future air levels. The EPA recommends a building survey be conducted to evaluate the degree of risk from asbestos-containing materials in buildings.

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Laboratory Testing Services

LAB. NO: 89-02534

6.0 CERTIFICATION AND SIGNATURES:

We certify this report is a true and authentic report of results obtained from our tests.

Respectfully submitted,

LABORATORY TESTING SERVICES, INC.

Brian Heneveld
Vice President

David C. Harvey
President

cs

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104132

Laboratory Testing Services

LAB NO: 89-02534

APPENDIX A

RESULTS OF TEM ANALYSIS

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Laboratory Testing Services

RESULT SHEET FOR TEM ASBESTOS AIR SAMPLE

CLIENT: Fred C. Hart Associates

DATE: July 7, 1989

SAMPLE NO.: 01

LTS NO.: T-00304

NO. OF GRID OPENINGS ANALYZED: 10

LAB. NO.: 89-02534

AVG. GRID OPENING AREA: 0.0070 mm^2

VOLUME: 1170 liters

TOTAL AREA ANALYZED: 0.070 mm^2

SENSITIVITY: 0.0047 Structure/cm^3

MANUFACTURER: Nucleopore

FILTER SIZE: 385 mm^2

LOT NO.: 81C3A/710/A8

COMPOSITION: Polycarbonate (.4um)

TOTAL NUMBER OF STRUCTURES: 8

TOTAL NUMBER OF ASBESTOS STRUCTURES: 0

MICROGRAPH #'S 1101-1102

STRUCTURE CLASSIFICATION

1) CHRYSOTILE STRUCTURES
   FIBERS 0 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 0

2) AMPHIBOLE STRUCTURES
   FIBERS 0 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 0

3) NON-ASBESTOS STRUCTURES
   FIBERS 7 BUNDLES 0 CLUSTERS 0 MATRICES 1 TOTAL 8

	.5< STRUCTURES <5um	>5um	TOTAL
ASBESTOS CONC. ON FILTER (STRUCTURES/mm^2)	--	--	<14.29
ASBESTOS CONC. IN AIR (STRUCTURES/cm^3)	--	--	<0.0047

(A1)

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laboratory Testing Services

RESULT SHEET FOR TEM ASBESTOS AIR SAMPLE

CLIENT: Fred C. Hart Associates

DATE: July 7, 1989

SAMPLE NO.: 02

LTS NO.: T-00305

NO. OF GRID OPENINGS ANALYZED: 12

LAB. NO.: 89-02534

AVG. GRID OPENING AREA: 0.0070 mm^2

VOLUME: 936 liters

TOTAL AREA ANALYZED: 0.084 mm^2

SENSITIVITY: 0.0049 $Structure/cm^3$

MANUFACTURER: Nucleopore

FILTER SIZE: 385 mm^2

LOT NO.: 81C3A/710/A8

COMPOSITION: Polycarbonate (.4um)

TOTAL NUMBER OF STRUCTURES: 16

TOTAL NUMBER OF ASBESTOS STRUCTURES: 0

MICROGRAPH #'S: 1103-1104

STRUCTURE CLASSIFICATION

1) CHRYSOTILE STRUCTURES
FIBERS 0 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 0

2) AMPHIBOLE STRUCTURES
FIBERS 0 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 0

3) NON-ASBESTOS STRUCTURES
FIBERS 13 BUNDLES 0 CLUSTERS 1 MATRICES 2 TOTAL 16

	.5< STRUCTURES <5um	>5um	TOTAL
ASBESTOS CONC. ON FILTER ($STRUCTURES/mm^2$)	--	--	<11.90
ASBESTOS CONC. IN AIR ($STRUCTURES/cm^3$)	--	--	<0.0049

(A2)

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Laboratory Testing Services

RESULT SHEET FOR TEM ASBESTOS AIR SAMPLE

CLIENT: Fred C. Hart Associates

DATE: July 7, 1989

SAMPLE NO.: 03

LTS NO.: T-00306

NO. OF GRID OPENINGS ANALYZED: 11

LAB. NO.: 89-02534

AVG. GRID OPENING AREA: 0.0070 mm^2

VOLUME: 1058 liters

TOTAL AREA ANALYZED: 0.077 mm^2

SENSITIVITY: 0.0047 Structure/cm^3

MANUFACTURER: Nucleopore

FILTER SIZE: 385 mm^2

LOT NO.: 81C3A/710/A8

COMPOSITION: Polycarbonate (.4um)

TOTAL NUMBER OF STRUCTURES: 8

TOTAL NUMBER OF ASBESTOS STRUCTURES: 1

MICROGRAPH #'S 1105-1108

STRUCTURE CLASSIFICATION

1) CHRYSOTILE STRUCTURES
   FIBERS 1 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 1

2) AMPHIBOLE STRUCTURES
   FIBERS 0 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 0

3) NON-ASBESTOS STRUCTURES
   FIBERS 4 BUNDLES 0 CLUSTERS 1 MATRICES 2 TOTAL 7

	.5< STRUCTURES <5um	>5um	TOTAL
ASBESTOS CONC. ON FILTER (STRUCTURES/mm^2)	12.99	--	12.99
ASBESTOS CONC. IN AIR (STRUCTURES/cm^3)	0.0047	--	0.0047

(A3)

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Laboratory Testing Services

RESULT SHEET FOR TEM ASBESTOS AIR SAMPLE

CLIENT: Fred C. Hart Associates

DATE: July 7, 1989

SAMPLE NO.: 04

LTS NO.: T-00307

NO. OF GRID OPENINGS ANALYZED: 12

LAB. NO.: 89-02534

AVG. GRID OPENING AREA: 0.0070 mm^2

VOLUME: 933 liters

TOTAL AREA ANALYZED: 0.084 mm^2

SENSITIVITY: 0.0049 Structure/cm^3

MANUFACTURER: Nucleopore

FILTER SIZE: 385 mm^2

LOT NO.: 81C3A/710/A8

COMPOSITION: Polycarbonate (.4um)

TOTAL NUMBER OF STRUCTURES: 15

TOTAL NUMBER OF ASBESTOS STRUCTURES: 0

MICROGRAPH #'S 1109-1110

STRUCTURE CLASSIFICATION

1) CHRYSOTILE STRUCTURES
   FIBERS 0 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 0

2) AMPHIBOLE STRUCTURES
   FIBERS 0 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 0

3) NON-ASBESTOS STRUCTURES
   FIBERS 9 BUNDLES 0 CLUSTERS 5 MATRICES 1 TOTAL 15

	.5< STRUCTURES <5um	>5um	TOTAL
ASBESTOS CONC. ON FILTER (STRUCTURES/mm^2)	--	--	<11.90
ASBESTOS CONC. IN AIR (STRUCTURES/cm^3)	--	--	<0.0049

(A4)

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Laboratory Testing Services

RESULT SHEET FOR TEM ASBESTOS AIR SAMPLE

CLIENT: Fred C. Hart Associates

DATE: July 7, 1989

SAMPLE NO.: 05

LTS NO.: T-00308

NO. OF GRID OPENINGS ANALYZED: 12

LAB. NO.: 89-02534

AVG. GRID OPENING AREA: 0.0070 mm^2

VOLUME: 904 liters

TOTAL AREA ANALYZED: 0.084 mm^2

SENSITIVITY: 0.0051 $Structure/cm^3$

MANUFACTURER: Nucleopore

FILTER SIZE: 385 mm^2

LOT NO.: 81C3A/710/A8

COMPOSITION: Polycarbonate (.4um)

TOTAL NUMBER OF STRUCTURES: 6

TOTAL NUMBER OF ASBESTOS STRUCTURES: 1

MICROGRAPH #'S 1111-1112

STRUCTURE CLASSIFICATION

1) CHRYSOTILE STRUCTURES
   FIBERS 1 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 1
2) AMPHIBOLE STRUCTURES
   FIBERS 0 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 0
3) NON-ASBESTOS STRUCTURES
   FIBERS 5 BUNDLES 0 CLUSTERS 0 MATRICES 0 TOTAL 5

	.5< STRUCTURES <5um	>5um	TOTAL
ASBESTOS CONC. ON FILTER ($STRUCTURES/mm^2$)	11.90	--	11.90
ASBESTOS CONC. IN AIR ($STRUCTURES/cm^3$)	0.0051	--	0.0051

(A5)

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LAB. NO.: 89-02534

APPENDIX B

CHAIN of CUSTODY RECORDS

75 URBAN AVENUE, WESTBURY, NEW YORK 11590 • (516) 334-7770 • (800) 433-0008 • FAX NO. 516-334-7720

D51-24

Laboratory Testing Services

75 URBAN AVENUE, WESTBURY, NEW YORK 11590 • (516) 334-7770 • (800) 433-0008 • FAX NO. 516-334-7720

CLIENT: F.C. Hart Assoc.

CHAIN OF CUSTODY RECORD

Lab No.: 89-02534

Sample Location (Address): Li Tungsten Glencove, NY

Outside Services Project Name

[redacted] 00266-02-00035-01

Sample I.D. No.	Date Collected	Time	No Of Containers	Sample Identification	Volume Of Air Collected	ASBESTOS-PCM	ASBESTOS-PLM	ASBESTOS-TEM	WETCHEM (specify)	G C (specify)	G C / M S (specify)	A A (specify)	BIO (specify)	I.P. (specify)	OPSAT (specify)	OTHER (specify)	REMARKS / ADDITIONAL REQUIREMENTS
01	6/26		1	TEM 1	1170			✓									
02	↓		↓	TEM 2	936			✓									
03	↓		↓	TEM 3	1058			✓									
04	6/27		↓	TEM 4	933			✓									
05	6/27		↓	TEM 5	904			✓									

Shipped Via: Federal Express # 9643704081

Relinquished by (Signature)	Date/Time	Agent of	Rec'd by (Signature)	Date/Time	Agent of
Printed Name			Claire Steppan / Printed Name: Claire Steppan	6/29 am	LTS
Relinquished by (Signature): Claire Steppan / Printed Name: Claire Steppan	6/29 am	LTS	Rec'd by (Signature) / Printed Name	Date/Time	Agent of
Relinquished by (Signature) / Printed Name	Date/Time	Received for Laboratory by (Signature) / Printed Name	Date/Time: 6/29/89 11:50 a.m	Remarks	

Sampler (Signature)

Samplers Name (Print): Em. Dimitrakas

104140

LAB.NO.: 89-02534

APPENDIX C

PRINTS OF ELECTRON PHOTOMICROGRAPHS

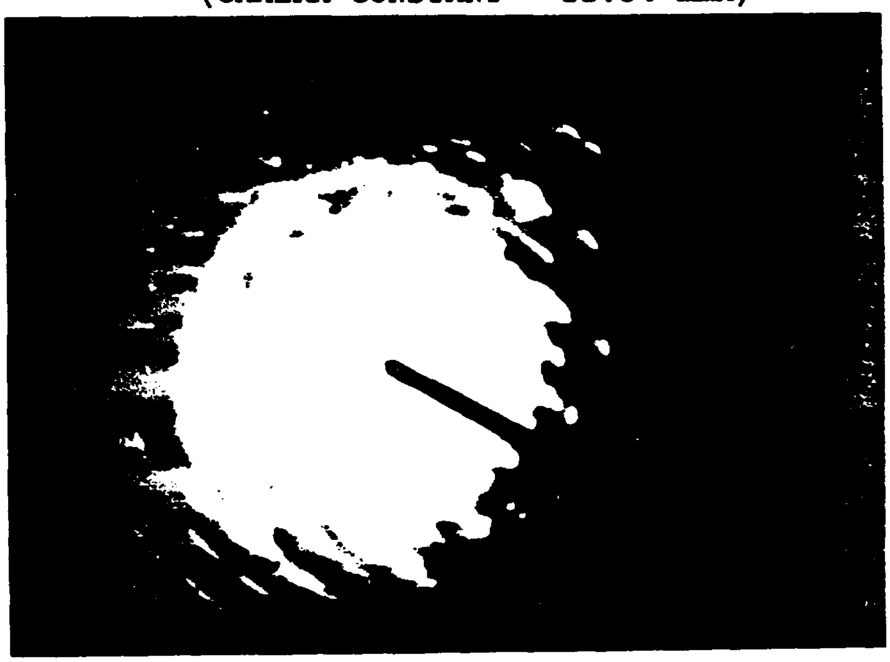
104141

75 URBAN AVENUE, WESTBURY, NEW YORK 11590 • (516) 334-7770 • (800) 433-0008 • FAX NO. 516-334-7720

Laboratory Testing Services

MICROGRAPH #1106
ELECTRON MICROGRAPH OF A REPRESENTATIVE
NON-ASBESTOS STRUCTURE
(ORIGINAL MAGNIFICATION = 19,000X)

MICROGRAPH #1105
SELECTED AREA ELECTRON DIFFRACTION (SAED) PATTERN OF A
NON-ASBESTOS STRUCTURE
(CAMERA CONSTANT = 22.54 mmÅ)



75 URBAN AVENUE, WESTBURY, NEW YORK 11590 • (516) 334-7770 • (800) 433-0008 • FAX NO. 516-334-7720

Laboratory Testing Services

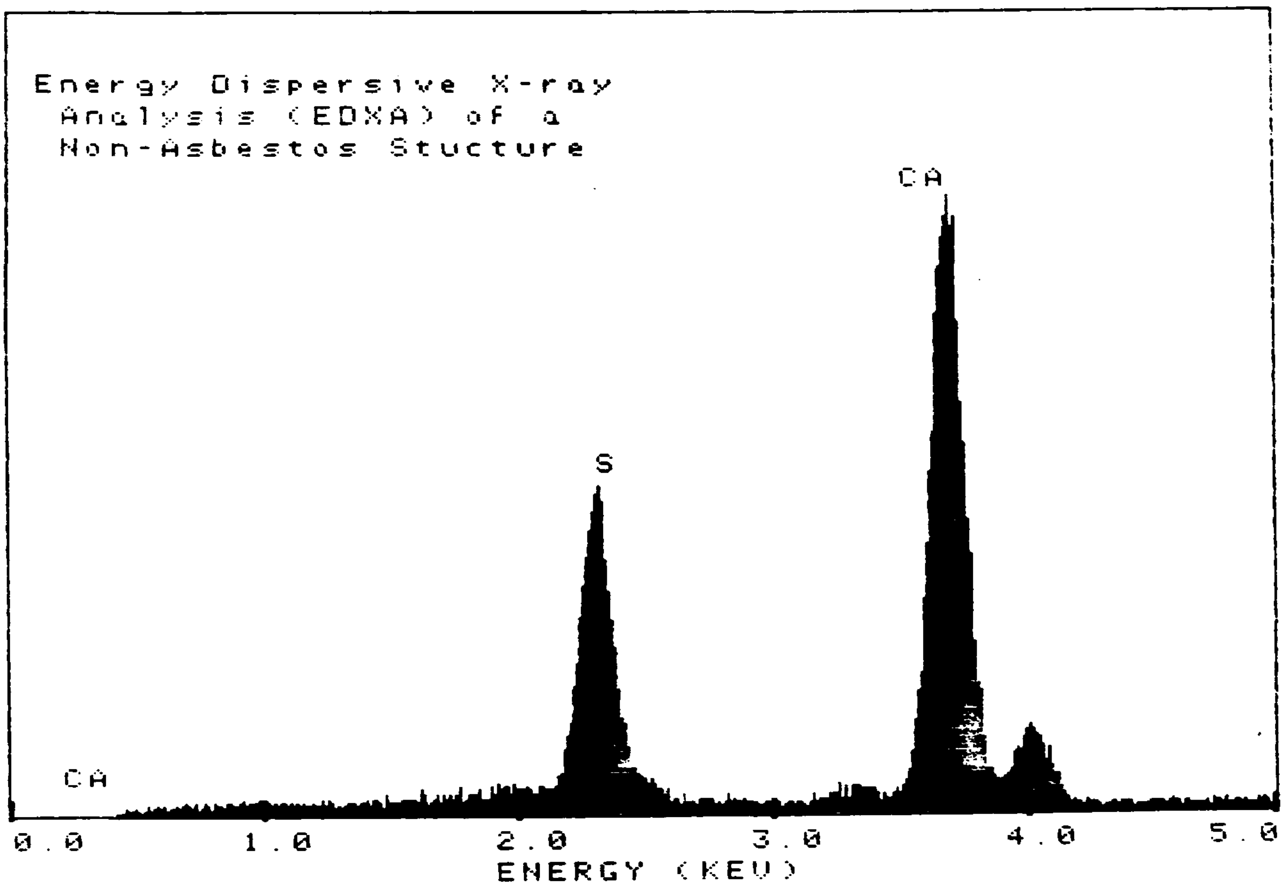
S306A6A■ Micrograph #1106 AVS/ON

CA LL

S306A6A

CUR: 0.0 0CNTS

2000FS 51■ T



07-Jul-89 18:10

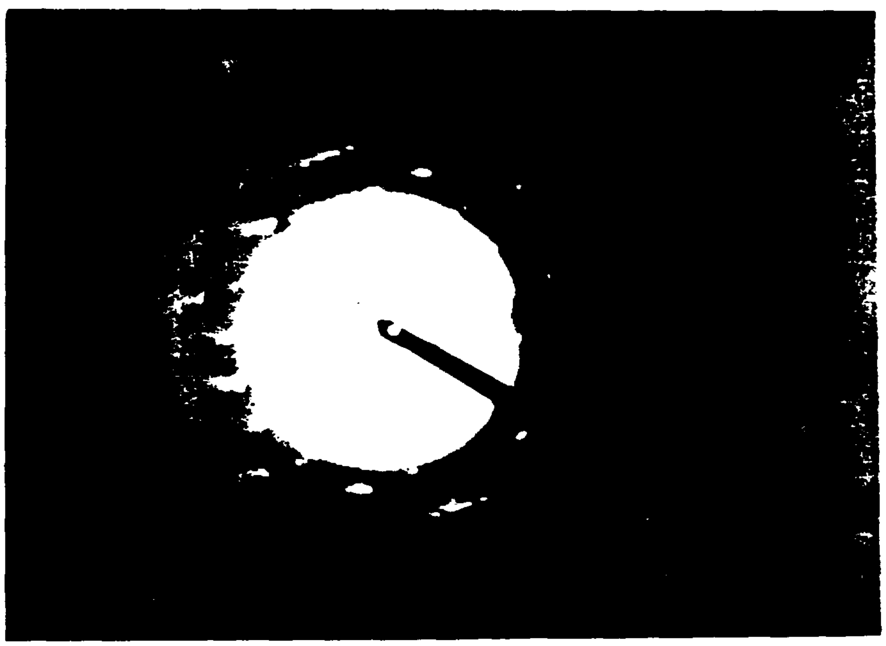
104143

75 URBAN AVENUE, WESTBURY, NEW YORK 11590 • (516) 334-7770 • (800) 433-0008 • FAX NO. 516-334-7720

Laboratory Testing Services

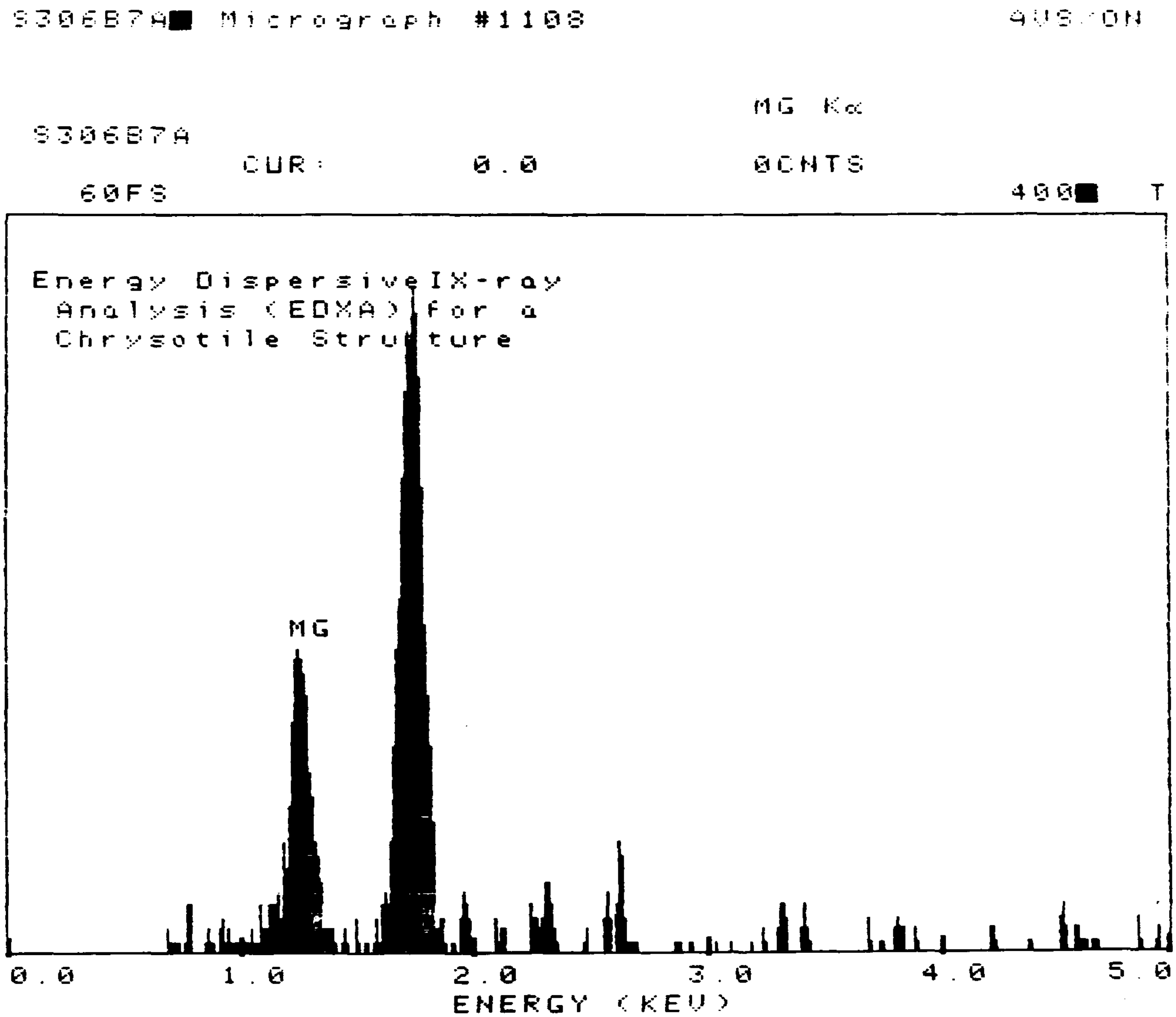
MICROGRAPH #1108
ELECTRON PHOTOMICROGRAPH OF A REPRESENTATIVE
CHRYSOTILE ASBESTOS STRUCTURE
(ORIGINAL MAGNIFICATION = 19,000X)

MICROGRAPH # 1107
SELECTED AREA ELECTRON DIFFRACTION (SAED) PATTERN OF
A CHRYSOTILE ASBESTOS STRUCTURE
(CAMERA CONSTANT = 22.54 mmÅ)



75 URBAN AVENUE, WESTBURY, NEW YORK 11590 • (516) 334-7770 • (800) 433-0008 • FAX NO. 516-334-7720

laboratory Testing Services



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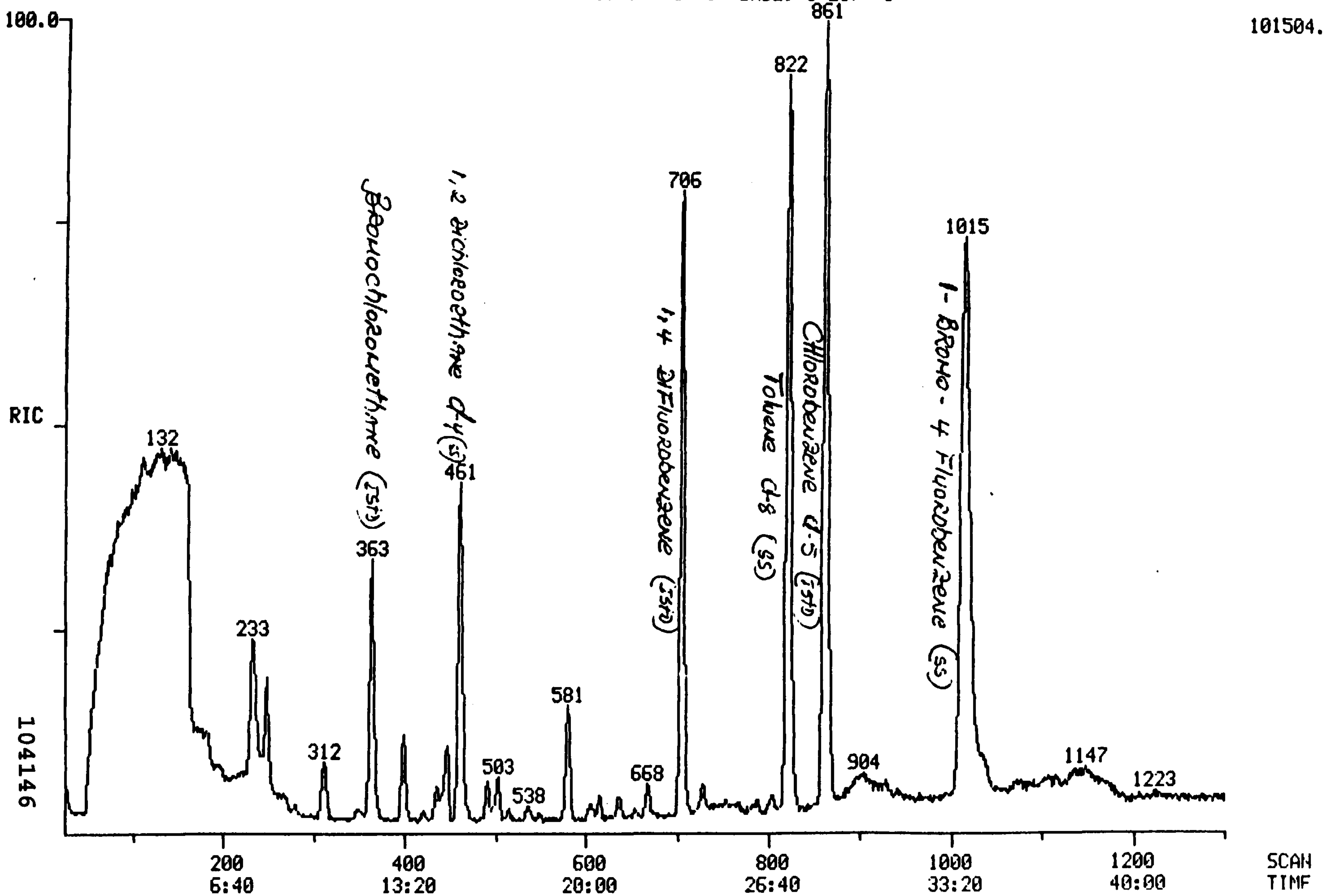
75 URBAN AVENUE, WESTBURY, NEW YORK 11590 • (516) 334-7770 • (800) 433-0008 • FAX NO. 516-334-7720

RIC
07/14/89 10:48:00
DATA: D8945 #1070 SCANS 25 TO 1300
CALI: D8945 #2
SAMPLE: F.C.HART,VOC-2/N9-9558,REC'D 7/7/89
CONDS.: TUBE/2MLS,100UL/5ML INSTD
RANGE: G 1,1300 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



APPENDIX A

SCOPE OF WORK

INTERIM ACTIONS
AT THE
LI TUNGSTEN SITE
63 HERB HILL ROAD
GLEN COVE, NEW YORK

Prepared by:

FRED C. HART ASSOCIATES, INC.
530 FIFTH AVENUE
NEW YORK, NEW YORK 10036-5166

July 17, 1989

HYDROGEOLOGIC INVESTIGATION AT THE LI TUNGSTEN FACILITY GLEN COVE, NEW YORK

April 1988

Geraghty & Miller, Inc.
Ground-Water Consultants
125 East Bethpage Road
Plainview, New York 11803

104148

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TABLE OF CONTENTS (Continued)

APPENDICES (Continued)

HYDROGEOLOGIC INVESTIGATION
AT THE LI TUNGSTEN FACILITY
GLEN COVE, NEW YORK

INTRODUCTION

Geraghty & Miller, Inc. (G&M) was retained by RTP Environmental Associates, Inc. (RTP) in March 1988 to conduct a hydrogeologic investigation of the Li Tungsten facility in Glen Cove, New York. The purpose of this investigation was to determine ground-water quality of the shallow ground-water system beneath the site and to determine whether sources of volatile organic compounds (VOCs) were present beneath the unpaved areas of the site. One particular objective of this investigation was to delineate a VOC plume that had been indicated by a previous G&M investigation in the spring of 1987. This report describes the most recent G&M investigation (March to April 1988), which was conducted concurrently with investigations by other environmental consultants who had been retained by RTP to assess other environmental aspects of the Li Tungsten site.

The possible regulatory implications of ground-water and soil-quality conditions of the site (as determined by the G&M soil survey) are discussed in this report, and remedial alternatives are addressed in a preliminary fashion. Cost estimates and time frames for the remedial alternatives are also included. It must be stressed, however, that regulatory review and approval of remedial alternatives must be obtained in advance of specifying a recommended set of remedial options. Since actions by regulators cannot be predicted with a high degree of confidence, the scope of ground-water and other environmental clean-up activities may differ from that which is discussed in this report.

The scope of work for G&M's investigation included the following: installation of 13 shallow monitoring wells; collection of soil samples from selected well borings; collection of ground-water quality samples from 21 monitoring wells; surveying of monitoring wells and waste piles; collection of water-level data; and performing a soil survey.

BACKGROUND

The Li Tungsten facility is located in northern Nassau County, Glen Cove, New York, in an industrial area. Consisting of approximately 20 acres, the site is situated on the north bank of Glen Cove Creek, which drains west into Hempstead Harbor (Figure 1). From the 1940s to the early 1980s, tungsten ores, imported from mainland China, were smelted at this facility. Recently, it has been inactive and now alternatives are being considered to develop the properties.

For the purposes of this investigation, the site has been divided into four parcels: I, II, III, and IV. A site map showing the individual parcels is presented in Figure 2. Parcel IV, which is not part of Li Tungsten, adjoins Parcel II and at RTP's request, was included in this investigation. The total area being investigated is comprised of approximately 24 acres.

This hydrogeologic investigation of the Li Tungsten facility was preceded by at least two previous investigations. The first investigation was not conducted by G&M and is reported to have taken place in the early 1980s when five monitoring wells were installed. Data collected during this first investigation were not available to G&M for review. However, G&M inspected and tested these wells as part of the second investigation and judged them to be in adequate condition for water-level and general water-quality monitoring, despite the lack of well-head protection and information about their installation. Therefore, these five monitoring wells were used as monitoring points for the G&M investigation.

The second investigation was conducted by G&M in the spring of 1987 for RTP and Old Stone Development Corporation. G&M supervised the installation of five additional wells during this investigation and used four of the five existing monitoring wells as monitoring points (the fifth well had not been discovered until the most recent investigation in the spring of 1988). Ground-water samples were collected from the existing wells for analyses for VOCs and for selected inorganic compounds before the new wells were sampled. As a result of the spring 1987 sampling, high concentrations of VOCs (approximately 20 parts per million [ppm] total) were detected in Well EMW-1, one of the original monitoring wells. Since VOCs were reportedly not used at the site, this discovery became the focus of the investigation and five monitoring wells were then installed at locations which would better define the VOC contamination.

One of the new locations, Well GM-3D, was installed as a cluster well (two wells) to Well EMW-1 to monitor the zone 10 ft below the bottom of Well EMW-1. The other wells (GM-1, GM-2, GM-4, and GM-5) were installed to obtain more information about the ground-water quality conditions at the site. Upon completion, the five new monitoring wells were sampled and the existing monitoring wells were resampled and analyzed for VOCs and selected inorganics. High concentrations of VOCs were confirmed in Well EMW-1 and were also detected in Well GM-3D, thus indicating a VOC plume with a depth greater than 20 feet. VOCs were either not detected or were detected in relatively low concentrations in the other wells sampled. G&M's second site investigation in the spring of 1987 was discontinued after these preliminary findings.

This most recent investigation involved the installation of 13 new monitoring wells and utilizes the two prior investigations and the ten existing monitoring wells to provide a more extensive evaluation of the ground-water quality conditions beneath the three parcels comprising the Li Tungsten site, as well as beneath a fourth parcel (Parcel IV), which is adjacent to Parcel II. The results of this investigation confirm and expand the ground-water flow and chemistry data collected by G&M during the spring 1987 work.

METHODOLOGY

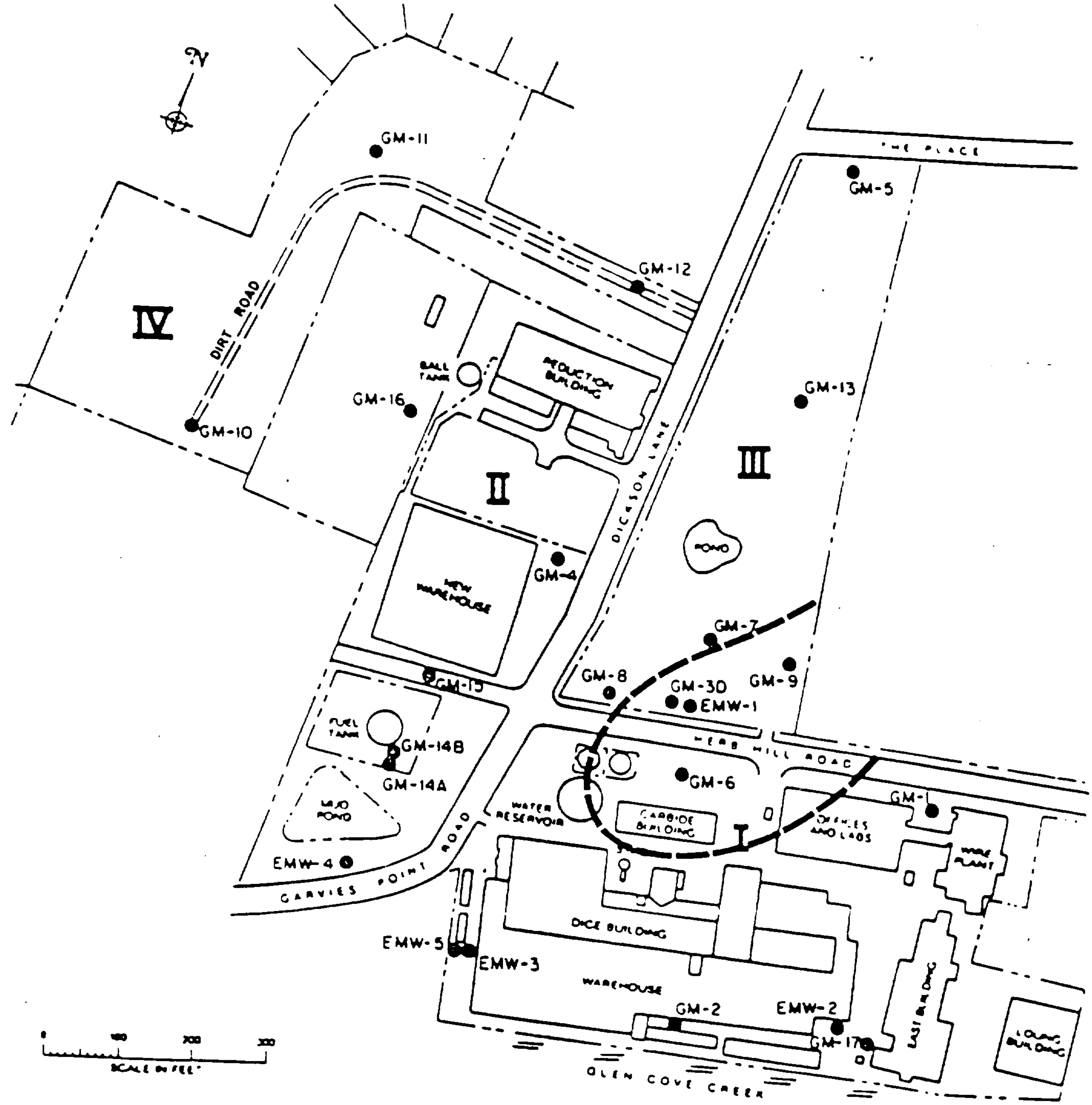
Installation of Monitoring Wells

The hollow-stem auger drilling method was used for the 18 monitoring wells installed under G&M's supervision. Wells GM-1 through GM-5 were installed between April 9, 1987 and April 21, 1987 by Slacke Test Borings, Inc., Kings Park, New York, and Wells GM-6 through GM-17 were installed between March 31, 1988 and April 15, 1988 by Empire Soils Investigations, Inc., Highland Park, New Jersey. The locations of these wells and the five wells installed during a previous investigation are shown on Figure 2.

GERAGHTY & MILLER, INC.
Ground-Water Consultants

COMPILED BY: Y. GLASSER
PREPARED BY: S. SCHAFFNER
PROJECT MGR: Y. GLASSER
DATE: 4-88
SCALE: SHOWN
FILE NO: NI342LII-1047

PREPARED FOR: RTP ENVIRONMENTAL ASSOC., INC.
Glen Cove, New York



EXPLANATION

II PARCEL NUMBER

● MONITORING WELL LOCATION

PROPERTY/PARCEL BOUNDARY

INFERRED EXTENT OF VOC PLUME WITH CONCENTRATION OF 100 ppb OR GREATER

NOTE: REFER TO TABLE 3 FOR CONCENTRATIONS OF VOCs DETECTED IN MONITORING WELLS SAMPLED IN SPRING 1987 AND SPRING 1988

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SUBJECT

INFERRED EXTENT OF PLUME OF VOCs IN SHALLOW GROUND-WATER S STEM IN THE VICINITY OF LI TUNGSTEN, GLEN COVE, NEW YORK

FIGURE 5

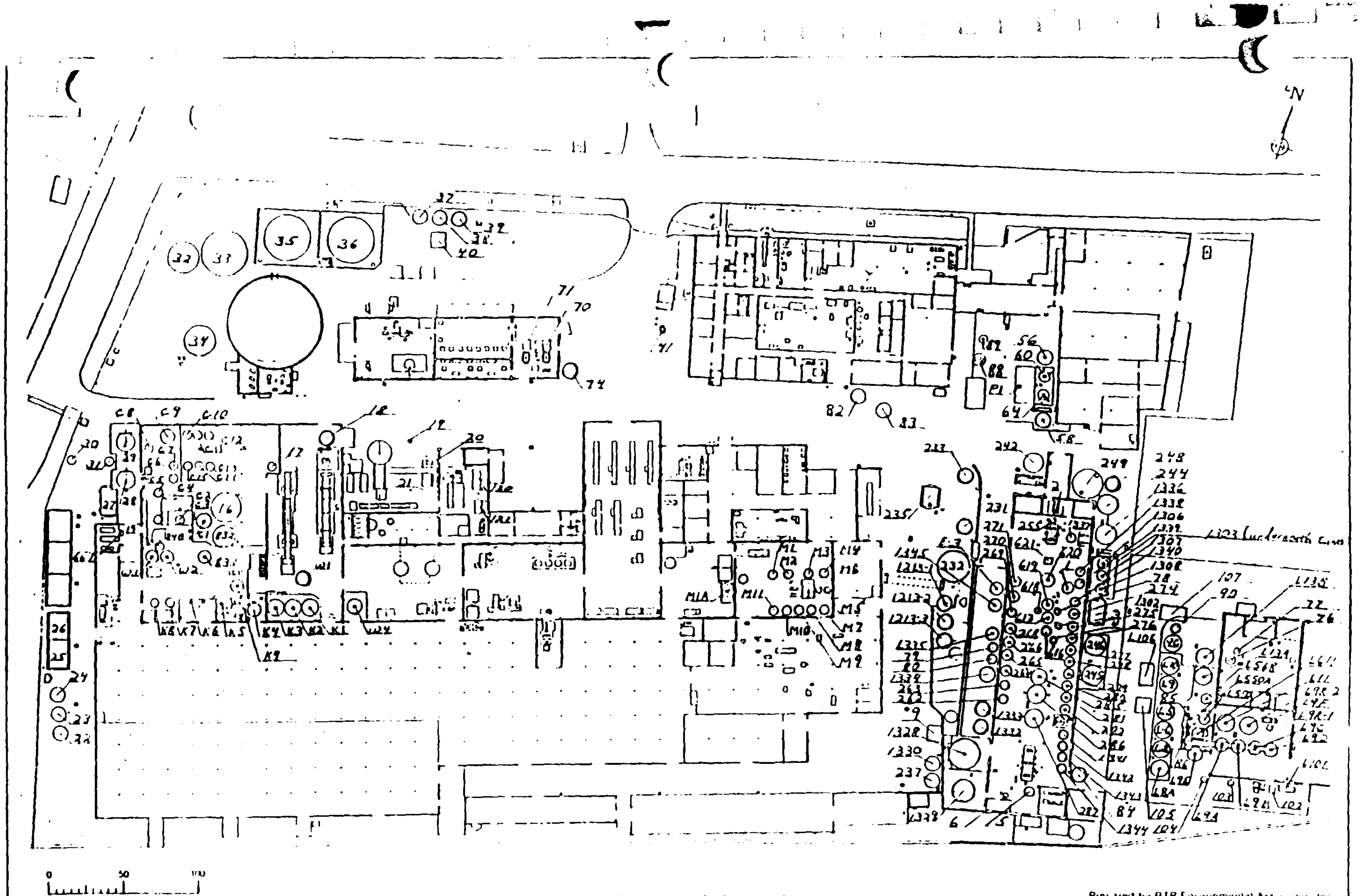

Figure 1: Map of Tank Numbers and Locations

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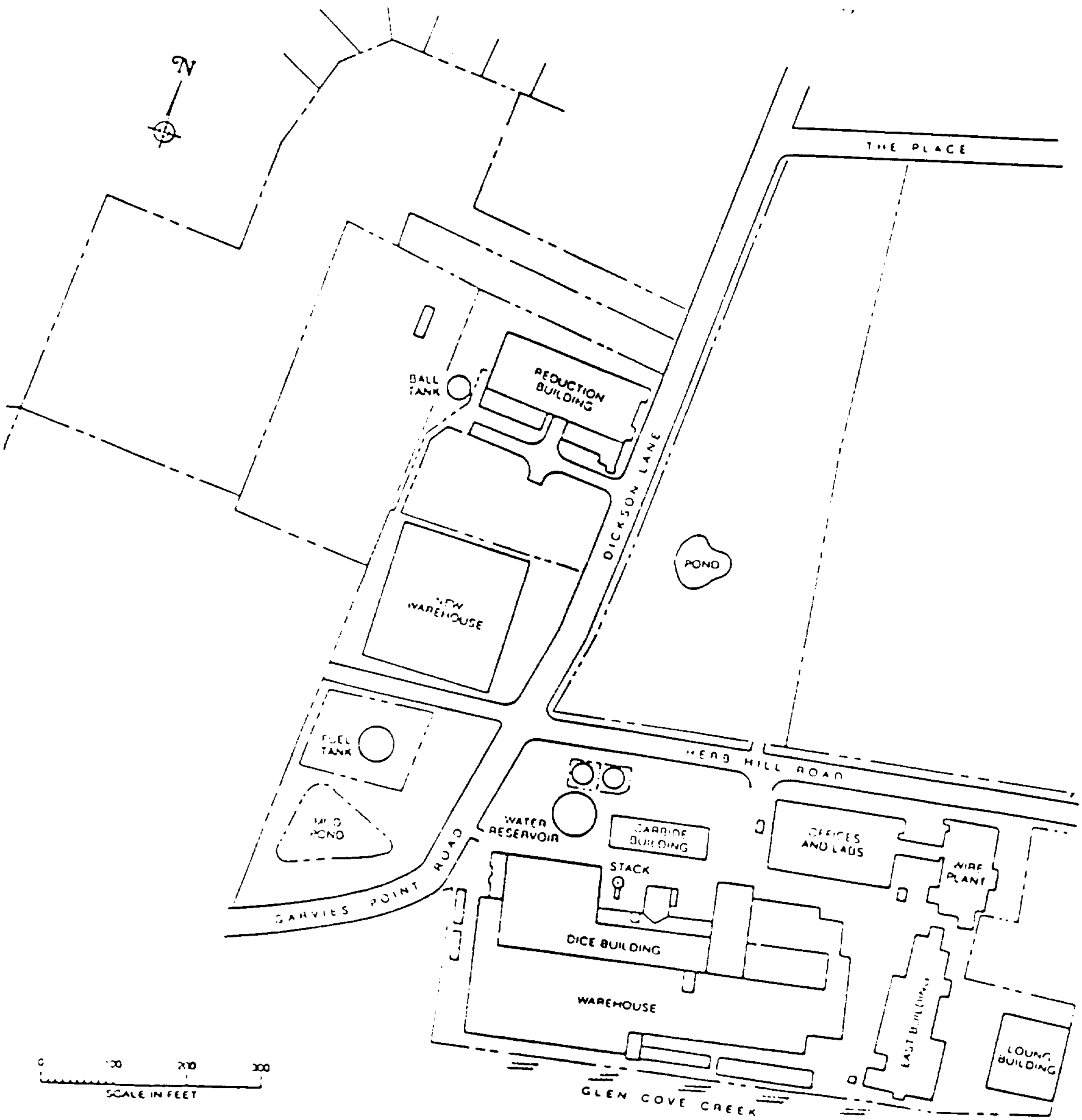

Prepared by RTP Environmental Associates, Inc.

Figure 2. Li Tungsten Facility Site Plan.

Split-spoon samples of the formation were collected at 5-ft intervals in each borehole during the two G&M investigations. Split-spoon samplers were decontaminated either by steam cleaning or by using a Micro™ solution followed by a distilled water rinse. The samples collected from each borehole were described by an on-site G&M hydrogeologist. Sample core logs are presented in Appendix A.

Soil samples from selected boreholes were retained for laboratory analysis. Soil samples from Wells GM-9, GM-10, and GM-11 were submitted to Enviropact Northeast, Inc., (Enviropact) Yonkers, New York, another consultant to RTP, for VOC analyses. Samples of the drill cuttings from Well GM-14A were sent to EcoTest Laboratories, Inc., North Bellmore, New York, for analysis of VOCs, polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPHC), and selected metals using extraction procedure (EP) testing methods.

Upon completion of the borehole, 2-inch diameter PVC screen and casing was installed inside the augers with the 10-ft long screen extending partially above the water table. An artificial gravel filter pack was emplaced around the well screen through the inside of the augers from the bottom of the borehole to at least 1 ft above the top of the screen. A layer of bentonite pellets was emplaced above the gravel pack to seal the screen zone from potential contamination from the surface. The remaining annular space was filled with a cement/bentonite grout mixture.

All the wells were completed with locking, protective well-head assemblies. Wells located in active areas were completed with flush-mounted, curb box assemblies. The remaining wells were completed with aboveground protective casings. Well construction details for the G&M wells and the five previously installed wells (EMW wells) are presented in Table 1. Well construction diagrams are presented in Appendix B.

As mentioned above, all the monitoring wells were installed with the well screens extending partially above the water table, except Wells GM-3D and GM-14A. Well GM-3D was installed as a cluster well to Well EMW-1 where high concentrations of VOCs had been found during the first G&M investigation (spring 1987).

Well GM-14A was installed downgradient of a reported fuel spill on Parcel II; however, the nature of formation materials made the water table difficult to locate without waiting an extended period of time for water-level stabilization. The well screen was set entirely below the stabilized water level, and this observation was used to construct another well, GM-14B, approximately 10 ft north of Well GM-14A to monitor for a possible floating phase.

As a health and safety measure, air monitoring equipment (HNU and OVA) was used by the on-site hydrogeologist to monitor the breathing zone for volatile compounds. VOCs were not encountered at any time during the drilling program as indicated by the above monitoring. The Health and Safety Plan (HASP) followed by G&M and its subcontractors is presented in Appendix C.

Most of the wells were developed by using a centrifugal pump to evacuate several volumes of water or until the water pumped was relatively clear and sediment-free. This procedure ensures good hydraulic interconnection between the well screen and the surrounding formation. Well GM-10 was developed by bailing because the water level was beyond the suction limit of a centrifugal pump. Although the water level was at the surface (within suction limit), Well GM-16 was also developed by bailing because this well was installed on the same day it was sampled. The elevation of the measuring point of the 23 new and existing monitoring wells was surveyed to the nearest 0.01 ft and the horizontal location of the wells were measured by Baldwin & Cornelius, Engineers and Surveyors, Freeport, New York. Well GM-17, had not been installed when surveying occurred and since the surveying could not be delayed, this well was not surveyed .

Sampling of Monitoring Wells

A total of 21 monitoring wells was sampled between April 7, 1988 and April 15, 1988. On April 7 and 8, 1988, the nine wells which had been installed during the most recent investigation and the five wells from the first site investigation were sampled. The remaining seven wells were sampled on April 15, 1988, following installation. The only on-site wells not sampled were GM-14B, which is being used to monitor for a floating liquid phase downgradient of a reported oil spill, and Well GM-17 which was installed after sampling took place. Samples were collected according to USEPA guidelines.

Prior to collection of ground-water samples, between three and five well volumes were evacuated from each well by bailing or by pumping. Samples were collected from each well by means of a Teflon™ bailer which was lowered into the well using new, polypropylene rope. All bailers were decontaminated using a Micro™ solution followed by a distilled water rinse. For wells evacuated by means of a centrifugal pump, new polyethylene tubing was used.

Samples were collected for the following analyses: VOCs and selected inorganic parameters (metals and nonmetals). The selection of the analytical parameters was based on plant uses and processing of materials at Li Tungsten and on preliminary testing by Enviropact, Inc.

All samples collected for metals analyses were field-filtered through an 0.45-mm filter membrane and preserved with nitric acid (HNO_3). At the end of each day of sampling, samples were hand-delivered to EcoTest Laboratories, Inc., North Babylon, New York. Water sampling logs for the 21 wells sampled are presented in Appendix D.

Soil Survey

On April 21 and 22, 1988, G&M conducted a survey of the surficial soils at the Li Tungsten facility using a portable gas chromatograph (GC) to determine whether VOCs were present in soils at the site. The survey was focused on the unpaved areas (portions of Parcels II, III, and IV) where dumping or spilling of VOCs would most likely have occurred.

The Photovac (Model 10S50) GC used for this survey has the capability to identify and quantify VOCs in the field. Based on data that had been previously gathered at the Li Tungsten site, the portable GC was calibrated for three specific compounds: 1,2-dichloroethene, trichloroethylene, and tetrachloroethene. Prior to any analysis, the GC was calibrated with a 1-ppm standard of these three compounds. Next, a distilled water blank was tested. The technique used by G&M to test the soil samples facilitates measurement of VOCs even at low concentrations and is described below.

Soil samples were collected from the upper 0.5 ft of the soil and transferred to 40 milliliter (ml) glass vials. Each vial was filled halfway with soil and capped and returned to the station where the GC was set up. Prior to analysis, 20 ml of distilled water was added to each sample. The sample was then agitated for 1 minute. Next, a 300-microliter (ul) sample of the headspace above the soil/water mixture was injected into the GC for analysis.

The soil samples were collected from shallow holes excavated with a hand trowel. Between each use, the hand trowel was cleaned using a Micro™ solution followed by a distilled water rinse. A new pair of disposable vinyl gloves was used for handling each sample. Parcel III was studied in the greatest detail since this parcel is unpaved and covered mostly by woods, except for a cleared area along Herb Hill Road formerly used for parking. Buried drums and piles of solid residues were observed in this area.

A grid system, consisting of 21 sample locations, was established for Parcel III. The sampling locations are shown on Figure 3. Additional samples were collected along the fence separating Parcel III from a former dry cleaning facility.

A total of nine soil samples was collected along a dirt road in Parcel IV where dumping would most likely have taken place. This road was overgrown with weeds and other secondary growth and had to be cleared in order to install Wells GM-10, GM-11, and GM-12. Aerial photographs of the site (circa 1960) reveal this road to be clear and free of vegetation, indicating that it was once being used regularly.

A total of five soil samples was also collected from Parcel II immediately north of the Reduction Building. This area drains runoff from topographically higher areas in the vicinity of the propane tank where piles of solid residue are located. VOCs that may have been disposed of near or with the solid residues would most likely be transported by runoff to the drainage area north of the Reduction Building on Parcel II where the samples were collected.

EXPANDED SCOPE OF WORK

Additional Wells

During the most recent investigation at the site, the scope of work was expanded at the request of Campon Realty Corporation and RTP to include the installation of three additional monitoring wells on Parcel I. These wells were planned in the vicinity of two proposed canals included in the planned residential development on this parcel. The purpose of this additional work was to obtain more information on the subsurface environment with respect to bulkheading structures and disposal of materials which may be dredged from the canals.

Of the three proposed monitoring wells, only Well GM-17 was installed. The other two proposed wells were not installed because of concern that contamination in the shallow ground-water system would potentially be introduced to deeper hydrogeologic zones during drilling operations. Since there was insufficient time for adequate site preparation to eliminate this new concern, the additional drilling was cancelled.

Ground-water samples were not collected from Well GM-17; however, this well was developed and used for water-level measurements.

Well-Head Protection

Protective, locking, well-head assemblies were installed on four of the five unprotected wells (EMW-2, EMW-3, EMW-4, and EMW-5) installed during the first site investigation. This was done to protect against vandalism as these wells had been previously unprotected. Also, a locking curb box assembly was installed at Well GM-4 because the original curb box was apparently destroyed during snow removal operations near the new warehouse on Parcel II.

Laboratory Analyses

The list of analytical parameters for ground-water samples was expanded to include compounds detected by Enviropact's analyses of soil and solid residues. Additionally, at the request of RTP, soil samples from well borings GM-14A and GM-17 were sent to EcoTest for analyses of VOCs, TPHC, PCBs, and metals using EP testing methods.

Surveying

During the surveying of the monitoring wells, RTP, in conjunction with Enviropact, requested that piles of solid residues on Parcels II and III be surveyed so that volumes of these materials could be calculated. This information would be used by Enviropact to estimate costs for removal and disposal of these materials.

HYDROGEOLOGY

The Li Tungsten facility is underlain by unconsolidated deposits of sand, silt, and clay, totaling more than 500 ft thick, which overlie the crystalline bedrock surface (Swarzenski, 1963). The uppermost stratigraphic unit is of

Upper Pleistocene age and is part of the Harbor Hill ground moraine. This deposit is thin in the Li Tungsten vicinity and ranges from 5 ft to as much as 40 ft in thickness and consists of a heterogeneous mixture of sand, silt, clay, and boulders. Boulders were not encountered during the field program except during the drilling of Well GM-15 just below the concrete slab. However, boulders with diameters of 1 ft to 3 ft were observed in the wooded areas of Parcels III and IV.

Beneath the Harbor Hill ground moraine lies another sequence of Upper Pleistocene deposits known as Harbor Hill drift, which comprises the Upper Glacial aquifer in the vicinity of the site. The thickness, of the Upper Glacial aquifer at the site is approximately 150 ft to 200 ft (Kilburn, 1987).

Geologic logs for wells in the vicinity of the site indicate that the Magothy Formation is absent. The Upper Glacial aquifer rests unconformably on the clay member of the Raritan Formation, approximately 200 ft below the site. To the west and east, there is another confining unit known as the Port Washington Clay.

Between April 13, 1988 and April 18, 1988, Baldwin & Cornelius, P.C., Freeport, New York, surveyed the measuring points of 22 of the 23 monitoring wells to the nearest 0.01

ft. (GM-17 was not installed during surveying activities.) These data were used to calculate water-level elevations from measurements made on April 21 and April 26, 1988. A summary of water-level elevation data for these two dates is presented in Table 2. A contour map of the water-table surface was prepared from the water-level data collected on April 26, 1988 (see Table 2) and is presented on Figure 4.

This map indicates that ground water in the shallow ground-water system flows south toward Glen Cove Creek, which is consistent with published data (Kilburn, 1987). It is also apparent that perched-water conditions exist at the site. Perched water is observed in the northern half of the plant in Wells GM-4, GM-5, GM-11, GM-12, GM-13, and GM-16 (Figure 4). The water-level elevation data also suggest that locally, perched ground water exists in the vicinity of Wells GM-9 and GM-14B. Perched water conditions are also recognized in the literature for the area (Swarzenski, 1963). When water percolating through surficial soils encounters a relatively-impermeable layer of silt or clay, its downward movement is stopped or impeded causing water to accumulate locally as perched ground water.

The water level in Well GM-14B was 3.61 ft higher in elevation than in Well GM-14A on April 26, 1988. Since both of these wells were adequately developed, the water-level difference must be the result of local perched water which is intercepted by GM-14B. The elevation of perched water at GM-14B may also be increased by ponding of rainwater in the dike surrounding the fuel oil tank.

WATER QUALITY

VOCs

All analytical results of ground-water samples collected at Li Tungsten will be discussed in terms of the New York State Department of Environmental Conservation (NYSDEC), Division of Water Technical and Operational Guidance Series, dated July 24, 1985 (TOGS). TOGS references in this report are used solely as reference points for comparative purposes and are not to be construed as applicable clean-up standards.

The results of the VOC analyses for samples collected in spring 1987 and spring 1988 are summarized in Table 3. Laboratory reports for the VOC analyses are presented in Appendix E. These results identify two areas with high concentrations of VOCs in the shallow ground-water system.

The first area where high concentrations of VOCs occur (from 78 ppb to more than 22,000 ppb total) were detected in monitoring wells on the southern portion of Parcel III (Wells EMW-1, GM-3D, GM-8, and GM-9) and in Monitoring Well GM-6 on the northern part of Parcel I, directly downgradient of the wells mentioned above. These data indicate the presence of a plume of VOCs in the shallow ground-water system that appears to be emanating from an unknown source on the southeastern part of Parcel III between Wells GM-7 and GM-9. It is likely that the contamination is from an off-site source. The adjacent property is reported to have been occupied by a dry cleaning operation several years ago and dry cleaners commonly use tetrachloroethene in their cleaning operations. This compound was the VOC detected in the highest concentrations in the wells defining the plume. The other two VOCs detected in high concentrations are trichloroethene and 1,2-dichloroethene. Both of these compounds are produced during the decomposition of tetrachloroethene.

High concentrations of VOCs were also detected in Well GM-10 (360 ppb total). This well is located in the southernmost part of Parcel IV on the edge of a steep drop-off approximately 30 ft north of the fence separating the Mattiace property to the south (Superfund site) from Parcel IV to the north. The compound occurring in highest concentrations in this well was 1,1,1-trichloroethane. Tetrachloroethene and its decomposition products were also detected in this well. The extent, and source of, the contamination detected in this well is not known.

VOCs were not detected in the wells installed in the perched ground-water zone in the northern part of the site, except in Well GM-13 in a low concentration totaling 18 ppb. This well is installed in an area where solid residues from the smelting operation were disposed.

VOCs were either not detected or detected in relatively low concentrations (less than 100 ppb) in the remaining wells at the site. The inferred extent of the VOC plume (with total VOC concentrations of 100 ppb or greater) is shown on Figure 5.

Inorganics

Metals

A summary of the results of the metals analyses for the monitoring wells sampled in spring 1987 and spring 1988 are presented in Table 4. Laboratory reports for the metals analyses are presented in Appendix E.

Of the 13 metals analyzed, four were found to exceed and/or equal the TOGS values (lead, chromium, cadmium, and arsenic). The TOGS value for lead (0.025 ppm) was exceeded in Wells EM-3 (0.060 ppm), EMW-4 (0.075 ppm), and GM-14A (0.070). Chromium was only detected in Well GM-14A in a concentration equal to the TOGS value (0.050 ppm). Cadmium was detected in concentrations exceeding the TOGS value

(0.010 ppm) in Wells EMW-1 (0.040 ppm), EMW-3 (0.029 ppm), EMW-5 (0.017 ppm), GM-3D (0.020 ppm), and GM-8 (0.013 ppm). Although there is no TOGS value for tungsten, this metal was found in monitoring wells throughout the site. Solid residues of spent tungsten ores are known to have been disposed of in at least two areas of the site: the center of Parcel III, and on Parcel II northwest of the Reduction Building. In addition, solid residues are stored in deteriorated drums and crates throughout the site. These practices are likely the source of the tungsten found in the ground water beneath the site.

Nonmetals

Of the three nonmetals analyzed for in spring 1987 and spring 1988, chloride and sulfate were found in concentrations exceeding the TOGS values. Nitrate was not found in concentrations exceeding the TOGS value in any of the wells sampled.

Chloride was detected in concentrations exceeding the TOGS value in five wells: EMW-3 (1,900 ppm), EMW-4 (2,700 ppm), EMW-5 (740 ppm), GM-6 (260 ppm), and GM-14A (700 ppm). All these wells are located in the southwestern area of the site in the vicinity of the wastewater treatment system.

Sulfate was detected in concentrations exceeding the TOGS values in eight wells: EMW-1 (400 ppm), EMW-3 (1,100 ppm), EMW-3 (3,300 ppm), EMW-5 (450 ppm), GM-3D (350 ppm), GM-6 (450 ppm), GM-13 (430 ppm), and GM-14A (11,000 ppm). Most of these wells are also located in the southwestern area of the site in the vicinity of the wastewater treatment system.

In summary, the detections of inorganics exceeding TOGS values for the respective parameters were concentrated in monitoring wells located in the vicinity of the wastewater treatment system in the southwestern part of the site. Tungsten detected in monitoring wells at the site most likely results from disposal and storage activities practiced at the site.

Hydrocarbons

No floating phase of hydrocarbons was found in monitoring Wells EMW-3, EMW-5, and GM-14B when measurements were made in these wells (which are located downgradient of two reported spills at the site).

SOIL QUALITY

On April 21 and 22, 1988, using a portable GC, G&M conducted a survey of the surficial soils in unpaved areas of the site to determine whether VOCs were present. The results of the survey are summarized in Table 5.

In all, 36 soil samples were collected from Parcels II, III, and IV, and were analyzed for the targeted compounds (tetrachloroethene, trichloroethene, and 1,2-dichloroethene). The sample locations are shown on Figure 3. Tetrachloroethene was the only compound detected, and it occurred in two of the 36 samples analyzed. This compound was found at sample locations PS-1 and PS-2 in low concentrations of less than 10 ppb. Both of these samples were collected along the fence in the southeast part of Parcel III. No other VOCs were detected in any of the other samples collected at the site.

The results of this survey indicate that VOCs may not have been disposed of on the surficial soils in the areas studied. Since the focus of the survey was on areas where dumping of VOCs would most likely take place, it does not seem likely that dumping of VOCs has recently occurred. Two soil samples were collected from the drill cuttings from Well GM-14A, which is located downgradient of a reported fuel spill on Parcel II. The two samples were composited by EcoTest Laboratories, Inc. and analyzed for VOCs, PCBs, total petroleum hydrocarbons (TPHC), and metals using EP testing methods. The results of these analyses are summarized in Table 6, and the laboratory report is presented in Appendix F.

VOCs and PCBs were not detected in any of the samples analyzed. Arsenic was the only metal detected (0.041 ppm) which is below the federal standard of 5 ppm (40 CFR Section 261.24, Table 1, Section B). However, TPHC was detected in a concentration of 330 ppm. Although there is no standard in the State of New York for this parameter, the detection represents a high concentration and the regulatory response is uncertain.

REMEDIATION

Ground-Water Remediation

The plume of VOCs in the ground water which extends from Parcel III to Parcel I under Herb Hill Road will probably require remediation in accordance with New York State law. Although the plume does not appear to have the potential to affect any potable water source, it is moving in the direction of Glen Cove Creek and, therefore, will represent a long-term contaminant discharge to the environment if left unabated. Remediation of this VOC plume is technically feasible by employing a ground-water pumping-and-treatment system whereby contaminated water is pumped from the aquifer, the contaminants removed by air stripping or carbon adsorption, and the treated water is returned to the aquifer or discharged to surface water. The pump-and-treat system may be enhanced by source removal, soil vapor stripping, and the installation of hydraulic barriers to reduce water pumping rates.

The sediments which comprise the water-table aquifer in the VOC plume area at Li Tungsten are not permeable enough to permit continuous pumping with vertical wells. For this reason, a series of horizontal collector trenches with gravel-packed, perforated pipes might be a better choice for ground-water recovery. The system would require collection of ground water on Parcel I between the Carbide and Dice buildings to prevent further southward plume migration. The remediation would be enhanced by intercepting ground water on both sides of Herb Hill Road where the plume is most concentrated and by excavating the most contaminated sediments in the area of Wells EMW-1 and GM-3D. It might also be possible to remove additional VOCs by soil venting or soil vapor stripping under vacuum, but it would be necessary to conduct pilot testing of soil from these areas to determine whether induced vapor removal would work under the relatively low permeability conditions known to exist at the site. Likewise, it is difficult to estimate the time for plume cleanup without pilot testing; however, a 5- to 10-year period of operation is considered the minimum under comparable circumstances. Installation of a soil vapor recovery system in the area of highest VOC concentrations would be between $25,000 and $30,000 in capital cost, plus an annual operation and maintenance cost of $3,000 to $5,000.

The cost of constructing a similar pump-and-treat system in Nassau County, Long Island, is approximately $250,000 in capital costs, plus an approximate $75,000 annual operation and maintenance cost. Monitoring the effectiveness of the system in accordance with New York State Department of Environmental Conservation (NYSDEC) guidelines would most probably require an additional $10,000 per year. Summarizing the above costs over the 5 to 10 year operating period resuts in a remedial cost between $675,000 and $1.1 million.

It is not possible to predict the cost of soil excavation for source control because the area of high VOC concentrations extends beneath Herb Hill Road and disruption of the roadway and underground utilities would have to be estimated on the basis of a detailed structural engineering study. Our experience with similar situations leads us to conclude that this work would exceed the other capital costs for ground-water remediation. For this same reason, the cost of installing a hydraulic barrier, such as a clay slurry wall around the outside of the plume would be increased to the point where its feasibility would be questionable.

The preliminary assessment of remedial options and costs must be viewed from the perspective of ground-water contamination problems and possible future remediation on properties adjoining Li Tungsten. VOC contamination from the Mattiace property immediately west of Li Tungsten is being investigated as a Superfund site, and a former dry cleaning operation east of Li Tungsten may have created a VOC plume which crosses Li Tungsten property. If a pump-and-treat system is operated at Li Tungsten with no action on the adjoining VOC plumes, the Li Tungsten pumping system could cause off-site VOC contamination to migrate to Li Tungsten. This would extend the remediation time for an undetermined period. It would also be necessary to analyze the environmental impact of air discharges from the pump-and-treat system. If VOC emissions to the atmosphere are judged to be unacceptable, it may be necessary to add an additional stage of treatment by activated carbon. The issue of air emissions must also be considered in light of similiar treatment activities which may take place on the adjoining properties.

The ground-water chemistry data collected during the investigation do not indicate contamination by dissolved metals, which would require active ground-water remediation. Elevated concentrations of lead, cadmium, arsenic, and chromium near the mud pond are only slightly above the TOGS standards. High sulfate concentrations in wells near the mud pond indicate that the mud pond has leached into the ground water, and water-quality results from nearly all of the monitoring wells installed for the various investigations show elevated dissolved tungsten concentrations. The regulatory implications of the inorganic water-quality data are uncertain because the dissolved metals and sulfate do not pose a serious environmental or health hazard and because there is no ground-water standard for tungsten as yet. It is probable, however, that, at a minimum, a long-term ground-water monitoring program for substances resulting from Li Tungsten's operations would be required. The cost of long-term ground-water monitoring would most likely range between $15,000 and $20,000 per year, provided the existing monitoring wells can be retained. The period of monitoring cannot be predicted at this time; however, a minimum of 5 years of data would ordinarily be required before a petition for relief from monitoring would be considered by New York State.

FINDINGS AND CONCLUSIONS

1. Water-level data from monitoring wells at the site revealed the presence of two ground-water systems: (1) the shallow water-table system in the southern part of the site; and (2) a perched ground-water system in the northern section of the site.

2. Ground water flows southward toward Glen Cove Creek in both the shallow water-table system and the perched ground-water system.

3. The site is underlain by unconsolidated glacial deposits consisting of sand, silt, clay, and boulders that occur with a high degree of variability. In general, relatively low permeability deposits occur beneath the site as indicated by slow recovery of water levels during well development and ground-water sampling.

4. Analyses of ground-water samples collected in spring 1987 and spring 1988 indicate the presence of a VOC plume with maximum concentrations greater than 20 ppm. The plume is delineated by monitoring wells in the southern part of Parcel III and the northern part of Parcel I.

5. The principal VOC contaminant in the plume is tetrachloroethene, which is a chemical used by dry cleaners. The source of the plume is unknown. However, given the close proximity of a dry cleaning facility formerly located adjacent to Parcel III, it seems likely that the source of contamination is off-site.

6. High concentrations of VOCs were also detected in Well GM-10, located in the southern part of Parcel IV, approximately 30 ft north of the Mattiace property. The principal VOC contaminant detected in this well was 1,1,1-trichloroethene and it represents a separate problem from the VOC plume discussed above. The extent and source of the contamination detected in this well is unknown.

7. Analytical results indicate that the TOGS values for lead, cadmium, and arsenic were exceeded in monitoring wells located in the vicinity of the wastewater treatment system in the southwestern area of the site, the area most likely to be the source of the contamination observed.

8. Tungsten was detected in monitoring wells throughout the site. Although there are no TOGS values for this metal, the widespread presence of tungsten in the ground-water systems (water table and perched water) indicates that contamination was caused by past disposal practices.

9. Analytical results of the soil survey at the site indicate that VOCs may not have been dumped on the surficial soils in unpaved areas of the site.

Only one compound, tetrachloroethene, was detected in low concentrations in two of the 36 samples collected for analyses. These samples were taken along a fence that separates the lower portion of Area III where high concentrations of VOCs were detected, and an adjacent property to the west which was formerly occupied by a dry cleaning firm.

10. The drill cuttings from Well GM-14A were analyzed for VOCs, PCBs, TPHC, and metals (using EP testing methods) indicate that petroleum hydrocarbons were detected in a concentration of 330 ppm. VOCs and PCBs were not detected. The only metal detected was arsenic in a concentration of 0.041 ppm, which is below the federal standard of 5 ppm (40 CFR Section 261.24, Table 1, Section B). The results of this analysis suggest that soil excavated from this area may be suitable for certain disposal options. One such option would be to send the soil to an asphalt company which can use soils contaminated with petroleum hydrocarbons.

11. No floating phase of hydrocarbons was found in monitoring Wells EMW-3, EMW-5, and GM-14B when measurements were made in these wells (which are located downgradient of two reported spills at the site).

Respectfully submitted,

GERAGHTY & MILLER, INC.

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April 29, 1988
VJG/MJM:vk

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TABLES

Table 1. Summary of Monitoring Well Construction Details, Li Tungsten Facility, Glen Cove, New York.

Well Designation	Installation Date	Well Diameter (in)	Total Depth	Screened Interval	Gravel Pack	Bentonite Seal	Cement Grout	Height of Measuring P... (Rel. to l... surface
			Feet Below Land Surface					
First Investigation Wells 1)								
EMW-1	NA	4	14.1	4.1 - 14.1	NA	NA	NA	+1.40
EMW-2	NA	4	5.5	0.0 - 5.5	NA	NA	NA	+0.0
EMW-3	NA	4	9.9	+0.1 - 9.9	NA	NA	NA	+0.40
EMW-4	NA	4	18.6	8.6 - 18.6	NA	NA	NA	+1.60
EMW-5	NA	4	9.0	0.0 - 9.0	NA	NA	NA	0.0
Second Investigation Wells Spring 1987								
GM-1	4/09/87	2	14.8	4.8 - 14.8	2.0 - 4.8	0.8 - 2.0	0.0 - 0.8	+0.60
GM-2	4/14/87	2	12.4	2.4 - 12.4	1.1 - 2.4	0.8 - 1.1	0.55 - 0.8	-0.15
GM-3D	4/14/87	1.5	23.5	13.5 - 23.5	7.0 - 13.5	5.0 - 7.0	0.0 - 5.0	+0.40
GM-4	4/15/87	1.5	15.4	5.4 - 15.4	2.5 - 5.4	1.0 - 2.5	0.7 - 1.0	-0.30
GM-5	4/21/87	1.5	22.0	12.0 - 22.0	10.0 - 12.0	7.0 - 10.0	0.0 - 7.0	+0.90
Third Investigation Wells Spring 1988								
GM-6	3/31/88	2	12.2	2.2 - 12.2	1.0 - 2.2	0.5 - 1.0	0.0 - 0.5	-0.4
GM-7	4/01/88	2	12.9	2.9 - 12.9	1.0 - 2.9	0.5 - 1.0	0.0 - 0.5	+3.10
GM-8	4/04/88	2	12.9	2.9 - 12.9	2.0 - 2.9	1.0 - 2.0	0.0 - 1.0	+2.50
GM-9	4/04/88	2	12.1	2.1 - 12.1	1.5 - 2.1	1.0 - 1.5	0.0 - 1.0	+2.40
GM-10	4/06/88	2	54.1	44.1 - 54.1	42.0 - 44.1	40.0 - 42.0	0.0 - 40.0	+3.30
GM-11	4/07/88	2	14.2	4.2 - 14.2	3.0 - 4.2	2.0 - 3.0	0.0 - 2.0	+2.07
GM-12	4/11/88	2	14.0	4.0 - 14.0	3.0 - 4.0	2.0 - 3.0	0.0 - 2.0	+2.53
GM-13	4/11/88	2	16.8	6.8 - 16.8	5.0 - 6.8	3.0 - 5.0	0.0 - 3.0	+2.30
GM-14A	4/12/88	2	17.8	7.8 - 17.8	5.0 - 7.8	4.0 - 5.0	0.0 - 4.0	+2.50
GM-14B	4/14/88	2	11.3	1.3 - 11.3	0.5 - 1.3	0.2 - 0.5	0.0 - 0.2	+1.15
GM-15	4/13/88	2	14.3	4.3 - 14.3	2.0 - 4.3	1.0 - 2.0	0.0 - 1.0	-0.20
GM-16	4/16/88	2	9.0	+0.6 - 9.0	0.0 - 9.0	----	----	+0.60
GM-17 2)	4/18/88	2	10.5	0.5 - 10.5	0.5 - 10.5	----	0.0 - 0.5	-0.3

1) These wells were reportedly installed in the early 1980s by another consultant. Well construction details are deduced fro... field measurements and observations.

2) Well GM-17 was installed at the request of RTP as part of an expanded scope of work to obtain more information on subsurfa... conditions for proposed canals. Two other wells were proposed for this expanded scope of work but were cancelled due to t... constraints and uncertainties.

NA Not available.

Table 2. Summary of Ground-Water Elevation Data for Monitoring Wells at Li Tungsten Facility, Glen Cove, New York.

Well Designation	Measuring Point Elevation	April 21, 1988 Depth to Water *	April 21, 1988 Water Level Elevation **	April 26, 1988 Depth to Water *	April 26, 1988 Water Level Elevation **
EMW-1	16.75	5.78	10.97	5.86	10.89
EMW-2	6.96	0.35	6.61	0.41	6.55
EMW-3	9.64	2.95	6.69	3.19	6.45
EMW-4	12.56	5.36	7.20	5.53	7.03
EMW-5	9.62	3.05	6.57	3.19	6.43
GM-1	18.02	7.50	10.52	7.25	10.77
GM-2	6.64	----	----	1.21	5.43
GM-3D	16.02	5.15	10.87	5.23	10.79
GM-4	26.06	1.56	24.50	1.76	24.30
GM-5	61.94	15.50	46.44	15.98	45.96
GM-6	13.29	2.75	10.54	2.85	10.44
GM-7	21.55	10.81	10.74	10.90	10.65
GM-8	18.49	7.60	10.89	7.70	10.79
GM-9	20.60	5.47	15.13	5.64	14.96
GM-10	59.46	47.13	12.33	47.33	12.13
GM-11	67.47	7.60	59.87	7.71	59.76
GM-12	49.83	7.68	42.15	7.68	42.15
GM-13	44.09	13.40	30.69	13.53	30.56
GM-14A	17.25	8.15	9.10	8.20	9.05
GM-14B	16.16	3.15	13.01	3.40	12.76
GM-15	17.50	7.73	9.77	7.88	9.62
GM-16	36.44	0.69	35.75	0.67	35.77
GM-17	----	0.78	----	0.94	----

* Feet below measuring point.
** Feet above mean sea level.

Table 3. Concentrations of Volatile Organic Compounds Detected in Ground-Water Samples Collected Spring 1987 and Spring 1988, at Li Tungsten Facility, Glen Cove, New York.

Well Designation: / Date Sampled: / Volatile Organic Compound	TOG 1) (ppb)	EMW-1 3/12/87	EMW-1 4/7/87	EMW-1 4/8/88	Rep. EMW-1 4/8/88	EMW-2 3/12/87	Rep. EMW-2 3/12/87	EMW-2 4/7/88	EMW-3 3/12/87
Chloroemethane		--	NA	--	--	--	--	--	--
Bromomethane		--	NA	--	--	--	--	--	--
Dichlordifluoromethane		--	NA	--	--	--	--	--	--
Vinyl chloride	5	51	42	52	52	--	--	--	--
Chloroethane		--	NA	--	--	--	--	--	--
Methylene chloride	.3	--	NA	--	--	--	--	--	--
Trichlorofluoromethane		--	NA	--	--	--	--	--	--
1,1-Dichloroethene	0.07	2,000	NA	6	6	--	--	--	--
1,1-Dichloroethane	50	--	NA	--	--	--	--	--	--
1,2-Dichloroethene		--	920	2,100	2,100	--	--	--	--
Chloroform	100	--	NA	--	--	1	--	--	--
1,2-Dichloroethane	0.8	--	NA	--	2	--	--	--	--
1,1,1-Trichloroethane	50	--	NA	--	--	--	--	--	--
Carbon tetrachloride	5	--	NA	--	--	--	--	--	--
Bromodichloromethane	50	--	NA	--	--	--	--	--	--
1,2-Dichloropropane	50	--	NA	--	--	--	--	--	--
trans-1,3-Dichloropropene		--	NA	--	--	--	--	--	--
Trichloroethylene	10	1,900	950	1,600	1,800	4	--	--	--
Chlorodibromomethane		--	NA	--	--	--	1	--	--
1,1,2-Trichloroethane	0.6	--	NA	--	--	--	--	--	--
cis-1,3-Dichloropropene		--	NA	--	--	--	--	--	--
2-Chloroethvinylether		--	NA	--	--	--	--	--	--
Bromoform		--	NA	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	0.2	--	NA	--	--	--	--	--	--
Tetrachloroethene	0.7	18,000	10,200	16,000	19,000	50	5	--	7
Chlorobenzene		--	NA	--	--	--	--	--	--
1,3-Dichlorobenzene		--	NA	--	--	--	--	--	--
1,2-Dichlorobenzene		--	NA	--	--	--	--	--	--
1,4-Dichlorobenzene		--	NA	--	--	--	--	--	--
Benzene		--	NA	6	4	--	--	--	--
Toluene	50	--	NA	--	2	--	--	--	--
Ethyl benzene	50	--	NA	--	--	--	--	--	--
m Xylene		NA	NA	--	--	NA	NA	--	NA
o+p Xylene	50	NA	NA	--	--	NA	NA	--	NA
Total VOCs:		21,951	12,112	19,764	22,966	55	6	--	7

All results in parts per billion (ppb).
-- Not detected.
FB Field blank.
TB Trip blank.
Detection limits presented in Appendix D.
Samples analyzed via USEPA Method 601, 602 by EcoTest Laboratories, Inc., North Babylon, New York.
1) TOG references in this report are used solely as reference point for comparative purposes and are not to be construed as applicable clean-up standards.
NA Not analyzed.

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Table 3. Concentrations of Volatile Organic Compounds Detected in Ground-Water Samples Collected Spring 1987 and Spring 1988, at Li Tungsten Facility, Glen Cove, New York.

Well Designation:		EMW-3	EMW-4	EMW-4	EMW-5	GM-1	GM-1	GM-2	GM-2
Date Sampled:		4/8/88	4/20/87	4/8/88	4/8/88	4/22/87	4/7/88	4/22/87	4/7/88
Volatile Organic Compound	TOG 1) (ppb)								
Chloroemethane		--	--	--	--	--	--	--	--
Bromomethane		--	--	--	--	--	--	--	--
Dichlordifluoromethane		--	--	--	--	--	--	--	--
Vinyl chloride	5	2	--	--	--	--	--	--	--
Chloroethane		--	--	--	--	--	--	--	--
Methylene chloride	50	--	--	--	--	--	--	--	--
Trichlorofluoromethane		--	--	--	--	--	--	--	--
1,1-Dichloroethene	0.07	--	--	--	--	--	--	--	--
1,1-Dichloroethane	50	--	--	--	--	--	--	--	--
1,2-Dichloroethene		--	--	--	--	--	4	6	--
Chloroform	100	--	--	--	--	--	--	--	--
1,2-Dichloroethane	0.3	--	--	--	--	--	5	--	--
1,1,1-Trichloroethane	50	--	--	--	--	--	--	--	--
Carbon tetrachloride	5	--	--	--	--	--	--	--	--
Bromodichloromethane	50	--	--	--	--	--	--	--	--
1,2-Dichloropropane	50	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene		--	--	--	--	--	--	--	--
Trichloroethylene	10	1	--	--	--	3	5	2	--
Chlorodibromomethane		--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	0.6	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene		--	--	--	--	--	--	--	--
2-Chloroethvinylether		--	--	--	--	--	--	--	--
Bromoform		--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	0.2	--	--	--	--	--	--	--	--
Tetrachloroethene	0.7	--	--	--	--	27	16	2	--
Chlorobenzene		--	--	--	--	--	--	--	--
1,3-Dichlorobenzene		--	--	--	--	--	--	--	--
1,2-Dichlorobenzene		--	--	--	--	--	--	--	--
1,4-Dichlorobenzene		--	--	--	--	--	--	--	--
Benzene		9	--	1	1	--	--	--	--
Toluene	50	--	--	--	--	--	--	--	--
Ethyl benzene	50	--	--	--	--	--	--	--	--
m Xylene		--	NA	--	--	NA	--	NA	--
o+p Xylene	50	--	NA	--	--	NA	--	NA	--
Total VOCs:		12	--	1	1	30	30	10	--

All results in parts per billion (ppb).
-- Not detected.
FB Field blank.
TB Trip blank.
Detection limits presented in Appendix D.
Samples analyzed via USEPA Method 601, 602 by EcoTest Laboratories, Inc., North Babylon, New York.
1) TOG references in this report are used solely as reference point for comparative purposes and are not to be construed as applicable clean-up standards.
NA Not analyzed.

Table 3. Concentrations of Volatile Organic Compounds Detected in Ground-Water Samples Collected Spring 1987 and Spring 1988, at Li Tungsten Facility, Glen Cove, New York.

Well Designation:		GM-3D	GM-3D	GM-4	GM-4	GM-5	GM-5	GM-6	Rep. GM-6
Date Sampled:		4/22/87	4/8/88	4/20/87	4/7/88	4/22/87	4/7/88	4/7/88	4/7/88
Volatile Organic Compound	TOG 1) (ppb)								
Chloroemethane		--	--	--	--	--	--	--	--
Bromomethane		--	--	--	--	--	--	--	--
Dichlordifluoromethane		--	--	--	--	--	--	--	--
Vinyl chloride	5	81	36	--	--	--	--	12	12
Chloroethane		--	--	--	--	--	--	1	2
Methylene chloride	50	--	--	--	--	--	--	--	--
Trichlorofluoromethane		--	--	--	--	--	--	--	--
1,1-Dichloroethene	0.07	--	3	--	--	--	--	--	--
1,1-Dichloroethane	50	--	--	--	--	--	--	--	--
1,2-Dichloroethene		1,500	860	--	--	--	--	430	400
Chloroform	100	--	--	--	--	--	--	--	--
1,2-Dichloroethane	0.8	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	50	--	--	--	--	--	--	--	--
Carbon tetrachloride	5	--	--	--	--	--	--	--	--
Bromodichloromethane	50	--	--	--	--	--	--	--	--
1,2-Dichloropropane	50	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene		--	--	--	--	--	--	--	--
Trichloroethylene	10	910	710	--	--	--	--	780	730
Chlorodibromomethane		--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	0.6	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene		--	--	--	--	--	--	--	--
2-Chloroethvinylether		--	--	--	--	--	--	--	--
Bromoform		--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	0.2	--	--	--	--	--	--	--	--
Tetrachloroethene	0.7	9,000	7,400	--	--	1	--	1,800	1,800
Chlorobenzene		--	--	--	--	--	--	--	--
1,3-Dichlorobenzene		--	--	--	--	--	--	--	--
1,2-Dichlorobenzene		--	--	--	--	--	--	--	--
1,4-Dichlorobenzene		--	--	--	--	--	--	--	--
Benzene		--	2	--	--	--	--	--	--
Toluene	50	--	--	--	--	--	--	--	--
Ethyl benzene	50	--	--	--	--	--	--	--	--
m Xylene		NA	--	NA	--	NA	--	--	--
o+p Xylene	50	NA	--	NA	--	NA	--	--	--
Total VOCs:		11,491	9,011	--	--	1	--	3,023	2,944

All results in parts per billion (ppb).

-- Not detected.

FB Field blank.

TB Trip blank.

Detection limits presented in Appendix D.

Samples analyzed via USEPA Method 601, 602 by EcoTest Laboratories, Inc., North Babylon, New York.

1) TOG references in this report are used solely as reference point for comparative purposes and are not to be construed as applicable clean-up standards.

NA Not analyzed.

Table 3. Concentrations of Volatile Organic Compounds Detected in Ground-Water Samples Collected Spring 1987 and Spring 1988, at Li Tungsten Facility, Glen Cove, New York.

Well Designation: / Date Sampled: / Volatile Organic Compound	TOG 1) (ppb)	GM-15 4/15/88	GM-16 4/15/88	Field Blank 3/12/87	Field Blank 1 4/7/88	Field Blank 2 4/8/88	Trip Blank 3/12/87	Trip Blank 4/8/88	Decon Water Tank 4/13/88
Chloroemethane		--	--	--	--	--	--	--	--
Bromomethane		--	--	--	--	--	--	--	--
Dichlordifluoromethane		--	--	--	--	--	--	--	--
Vinyl chloride	5	--	--	--	--	--	--	--	--
Chloroethane		--	--	--	--	--	--	--	--
Methylene chloride	50	--	--	--	--	--	--	--	--
Trichlorofluoromethane		--	--	--	--	--	--	--	--
1,1-Dichloroethene	0.07	--	--	--	--	--	--	--	--
1,1-Dichloroethane	50	--	--	--	--	--	--	--	--
1,2-Dichloroethene		--	--	--	--	--	--	--	--
Chloroform	100	--	--	--	--	--	--	--	--
1,2-Dichloroethane	0.8	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	50	--	--	--	--	--	--	--	1
Carbon tetrachloride	5	--	--	--	--	--	--	--	--
Bromodichloromethane	50	--	--	--	--	--	--	--	--
1,2-Dichloropropane	50	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene		--	--	--	--	--	--	--	--
Trichloroethylene	10	--	--	--	--	--	--	--	--
Chlorodibromomethane		--	--	1	--	--	1	--	--
1,1,2-Trichloroethane	0.6	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene		--	--	--	--	--	--	--	--
2-Chloroethvinylether		--	--	--	--	--	--	--	--
Bromoform		--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	0.2	--	--	--	--	--	--	--	--
Tetrachloroethene	0.7	--	--	2	--	--	--	--	--
Chlorobenzene		--	--	--	--	--	--	--	--
1,3-Dichlorobenzene		--	--	--	--	--	--	--	--
1,2-Dichlorobenzene		--	--	--	--	--	--	--	--
1,4-Dichlorobenzene		--	--	--	--	--	--	--	--
Benzene		--	--	--	--	--	--	--	--
Toluene	50	--	--	--	--	--	--	--	--
Ethyl benzene	50	--	--	--	--	--	--	--	--
m Xylene		--	--	--	NA	--	--	NA	--
o+p Xylene	50	--	--	--	NA	--	--	NA	--
Total VOCs:		--	--	3	--	--	1	--	1

All results in parts per billion (ppb).

-- Not detected.

FB Field blank.

TB Trip blank.

Detection limits presented in Appendix D.

Samples analyzed via USEPA Method 601, 602 by EcoTest Laboratories, Inc., North Babylon, New York.

1) TOG references in this report are used solely as reference point for comparative purposes and are not to be construed as applicable clean-up standards.

NA Not analyzed.

Table 4. Concentrations of Metals in Ground-Water Samples Collected Spring 1987 and Spring 1988, Li Tungsten Facility, Glen Cove, New York.

Well Designation: / Date Sampled: / Metals	TOG 1) (ppm)	EMW-1 3/12/87	EMW-1 4/7/87	EMW-1 4/8/88	Rep. EMW-1 4/8/88	EMW-2 3/12/87	Rep. EMW-2 3/12/87	EMW-2 4/7/88	EMW-3 3/12/87
Calcium as Ca		90	NA	90	90	65	NA	70	110
Cobalt as Co		0.11	NA	0.27	0.32	0.005	NA	--	0.12
Nickel as Ni		0.35	NA	0.45	0.40	--	NA	--	0.10
Sodium as Na		40	NA	34	34	88	NA	100	140
Mercury as Hg	.002	NA	NA	--	--	NA	NA	--	NA
Lead as Pb	.025	NA	NA	--	--	NA	NA	--	NA
Chromium as Cr	.050	NA	NA	--	--	NA	NA	--	NA
Cadmium as Cd	.010	NA	NA	0.034	0.040	NA	NA	--	NA
Arsenic as As	.025	NA	NA	0.002	0.002	NA	NA	0.004	NA
Tantalum		0.3	NA	0.09	0.34	0.3	NA	0.27	0.2
Tungsten		--	NA	--	--	2.4	NA	4.69	4.8
Copper as Cu	1.0	0.30	NA	NA	NA	--	NA	NA	--
Molybdenum as Mo		--	NA	NA	NA	0.21	NA	NA	0.07
Chloride as Cl	250.0	56	NA	65	65	100	NA	91	200
Nitrate as N	10.0	--	NA	--	--	--	NA	--	--
Sulfate as SO4	250.0	440	NA	400	350	--	NA	8.0	110
Specific conductance (umhos/cm)		1,000	NA	1,050	1,050	1,000	NA	1,000	1,400
pH (units)		5.4	NA	5.5	5.5	6.2	NA	6.75	6.3

All results in parts per million (ppm).
-- Not detected.
FB Field blank.
TB Trip blank.
Detection limits presented in Appendix D.
Samples analyzed via USEPA Method 601, 602 by EcoTest Laboratories, Inc., North Babylon, New York.
1) TOG references in this report are used solely as reference point for comparative purposes and are not to be construed as applicable clean-up standards.
NA Not analyzed.

Table 4. Concentrations of Metals in Ground-Water Samples Collected Spring 1987 and Spring 1988, Li Tungsten Facility, Glen Cove, New York.

Well Designation:		EMW-3	EMW-4	EMW-4	EMW-5	GM-1	GM-1	GM-2	GM-2
Date Sampled:		4/8/88	4/20/87	4/8/88	4/8/88	4/22/87	4/7/88	4/22/87	4/7/88
Metals	TOG 1) (ppm)								
Calcium as Ca		340	NA	620	190	NA	85	NA	65
Cobalt as Co		3.5	NA	0.40	0.72	NA	--	NA	0.008
Nickel as Ni		0.45	NA	0.35	0.25	NA	--	NA	--
Sodium as Na		1,000	NA	2,000	320	NA	30	NA	100
Mercury as Hg	.002	--	NA	--	--	NA	--	NA	--
Lead as Pb	.025	0.060	NA	0.075	--	NA	--	NA	--
Chromium as Cr	.050	0.006	NA	--	--	NA	--	NA	--
Cadmium as Cd	.010	0.029	NA	--	0.017	NA	--	NA	--
Arsenic as As	.025	0.14	NA	0.39	0.069	NA	--	NA	0.011
Tantalum		1.76	NA	3.91	0.52	NA	0.075	NA	0.28
Tungsten		154.0	NA	1.63	42.8	NA	0.38	NA	--
Copper as Cu	1.0	NA	NA	NA	NA	NA	NA	NA	NA
Molybdenum as Mo		NA	NA	NA	NA	NA	NA	NA	NA
Chloride as Cl	250.0	1,900	NA	2,700	740	NA	50	NA	110
Nitrate as N	10.0	--	NA	--	--	NA	--	NA	--
Sulfate as SO4	250.0	1,100	NA	3,300	450	NA	130	NA	32
S[illegible]ific conductance (umhos/cm)		4,000	NA	5,000	2,000	NA	975	NA	1,200
[illegible] units)		6.17	NA	5.64	6.51	NA	6.57	NA	6.90

All results in parts per million (ppm).

-- Not detected.

FB Field blank.

TB Trip blank.

Detection limits presented in Appendix D.

Samples analyzed via USEPA Method 601, 602 by EcoTest Laboratories, Inc., North Babylon, New York.

1) TOG references in this report are used solely as reference point for comparative purposes and are not to be construed as applicable clean-up standards.

NA Not analyzed.

Table 4. Concentrations of Metals in Ground-Water Samples Collected Spring 1987 and Spring 1988, Li Tungsten Facility, Glen Cove, New York.

Well Designation: / Date Sampled: / Metals	TOG 1) (ppm)	GM-30 4/22/87	GM-30 4/8/88	GM-4 4/20/87	GM-4 4/7/88	GM-5 4/22/87	GM-5 4/7/88	GM-6 4/7/88	Rep. GM-6 4/7/88
Calcium as Ca		NA	90	NA	19	NA	26	150	150
Cobalt as Co		NA	0.10	NA	--	NA	--	--	--
Nickel as Ni		NA	0.15	NA	--	NA	--	--	--
Sodium as Na		NA	44	NA	14	NA	26	120	130
Mercury as Hg	.002	NA	--	NA	--	NA	--	--	--
Lead as Pb	.025	NA	--	NA	--	NA	--	0.008	0.005
Chromium as Cr	.050	NA	--	NA	--	NA	--	--	--
Cadmium as Cd	.010	NA	0.020	NA	0.0014	NA	--	--	--
Arsenic as As	.025	NA	--	NA	--	NA	--	0.003	0.002
Tantalum		NA	0.33	NA	0.053	NA	0.051	0.14	0.14
Tungsten		NA	--	NA	0.51	NA	0.20	--	0.29
Copper as Cu	1.0	NA	NA	NA	NA	NA	NA	NA	NA
Molybdenum as Mo		NA	NA	NA	NA	NA	NA	NA	NA
Chloride as Cl	250.0	NA	65	NA	7	NA	59	260	260
Nitrate as N	10.0	NA	--	NA	--	NA	3.8	--	--
Sulfate as SO4	250.0	NA	350	NA	16	NA	40	450	450
Specific conductance (umhos/cm)		NA	875	NA	200	NA	475	1,600	1,600
pH (units)		NA	5.90	NA	6.61	NA	5.30	6.20	6.20

All results in parts per million (ppm).
-- Not detected.
FB Field blank.
TB Trip blank.
Detection limits presented in Appendix D.
Samples analyzed via USEPA Method 601, 602 by EcoTest Laboratories, Inc., North Babylon, New York.
1) TOG references in this report are used solely as reference point for comparative purposes and are not to be construed as applicable clean-up standards.
NA Not analyzed.

Table 4. Concentrations of Metals in Ground-Water Samples Collected Spring 1987 and Spring 1988, Li Tungsten Facility, Glen Cove, New York.

Well Designation: / Date Sampled:	TOG 1) (ppm)	GM-7 4/8/88	GM-8 4/8/88	GM-9 4/8/88	GM-10 4/15/88	GM-11 4/15/88	GM-12 4/15/88	GM-13 4/15/88	GM-14A 4/15/88
Metals									
Calcium as Ca		26	36	55	21	25	110	120	370
Cobalt as Co		--	0.005	--	0.024	--	--	0.40	0.40
Nickel as Ni		--	--	--	--	--	--	--	0.20
Sodium as Na		28	18	34	12	14	29	96	6,600
Mercury as Hg	.002	--	--	--	--	--	--	--	--
Lead as Pb	.025	--	--	--	--	--	--	--	0.070
Chromium as Cr	.050	--	--	--	--	--	--	--	0.050
Cadmium as Cd	.010	--	0.013	--	--	--	--	--	--
Arsenic as As	.025	--	--	--	--	--	--	0.002	0.78
Tantalum		0.07	0.27	0.11	--	--	--	--	2.26
Tungsten		--	--	--	0.40	0.11	--	--	39.40
Copper as Cu	1.0	NA	NA	NA	NA	NA	NA	NA	NA
Molybdenum as Mo		NA	NA	NA	NA	NA	NA	NA	NA
Chloride as Cl	250.0	14	26	43	14	22	65	25	700
Nitrate as N	10.0	--	0.6	1.0	26	3.5	--	--	1.0
Sulfate as SO4	250.0	68	230	150	48	50	150	430	11,000
Specific conductance (umhos/cm)		400	575	625	260	240	790	1,060	20,200
pH (units)		6.58	4.99	6.16	5.6	6.2	6.2	6.1	7.4

All results in parts per million (ppm).

-- Not detected.

FB Field blank.

TB Trip blank.

Detection limits presented in Appendix D.

Samples analyzed via USEPA Method 601, 602 by EcoTest Laboratories, Inc., North Babylon, New York.

1) TOG references in this report are used solely as reference point for comparative purposes and are not to be construed as applicable clean-up standards.

NA Not analyzed.

Table 4. Concentrations of Metals in Ground-Water Samples Collected Spring 1987 and Spring 1988, Li Tungsten Facility, Glen Cove, New York.

Well Designation:		GM-15	GM-16	Field Blank	Field Blank 1	Field Blank 2	Trip Blank	Trip Blank	Decon Water Tank
Date Sampled:		4/15/88	4/15/88	3/12/87	4/7/88	4/8/88	3/12/87	4/8/88	4/13/88
Metals	TOG 1) (ppm)								
Calcium as Ca		48	14	NA	NA	NA	NA	NA	NA
Cobalt as Co		0.030	0.010	NA	NA	NA	NA	NA	NA
Nickel as Ni		--	--	NA	NA	NA	NA	NA	NA
Sodium as Na		48	7.9	NA	NA	NA	NA	NA	NA
Mercury as Hg	.002	--	--	NA	NA	NA	NA	NA	NA
Lead as Pb	.025	--	--	NA	NA	NA	NA	NA	NA
Chromium as Cr	.050	--	--	NA	NA	NA	NA	NA	NA
Cadmium as Cd	.010	--	0.007	NA	NA	NA	NA	NA	NA
Arsenic as As	.025	0.002	--	NA	NA	NA	NA	NA	NA
Tantalum		--	--	NA	NA	NA	NA	NA	NA
Tungsten		0.16	--	NA	NA	NA	NA	NA	NA
Copper as Cu	1.0	NA	NA	NA	NA	NA	NA	NA	NA
Molybdenum as Mo		NA	NA	NA	NA	NA	NA	NA	NA
Chloride as Cl	250.0	120	8	NA	NA	NA	NA	NA	NA
Nitrate as N	10.0	--	--	NA	NA	NA	NA	NA	NA
Sulfate as SO4	250.0	48	200	NA	NA	NA	NA	NA	NA
Specific conductance (umhos/cm)		640	140	NA	NA	NA	NA	NA	NA
pH (units)		6.2	6.2	NA	NA	NA	NA	NA	NA

All results in parts per million (ppm).

-- Not detected.

FB Field blank.

TB Trip blank.

Detection limits presented in Appendix D.

Samples analyzed via USEPA Method 601, 602 by EcoTest Laboratories, Inc., North Babylon, New York.

1) TOG references in this report are used solely as reference point for comparative purposes and are not to be construed as applicable clean-up standards.

NA Not analyzed.

Table 5. Concentrations of Selected Volatile Organic Compounds Tested for During Soil Survey of Parcels II, III, and IV.

Sample Location		Concentration of 1,2-Dichloroethene (ppb)	Concentration of Trichloroethene (ppb)	Concentration of Tetrachloroethene (ppb)
Parcel II	Stream	--	--	--
	1	--	--	--
	2	--	--	--
	3	--	--	--
	4	--	--	--
	5	--	--	--
Parcel III	1A	--	--	--
	1B	--	--	--
	1C	--	--	--
	2A	--	--	--
	2B	--	--	--
	2C	--	--	--
	3A	--	--	--
	3B	--	--	--
	3C	--	--	--
	4A	--	--	--
	4B	--	--	--
	4C	--	--	--
	5A	--	--	--
	5B	--	--	--
	5C	--	--	--
	PS-1	--	--	5.6
	PS-2	--	--	5.1
	PS-3	--	--	--
	PS-3A	--	--	--
	PS-4	--	--	--
	PS-4A	--	--	--
Parcel IV	1	--	--	--
	2	--	--	--
	3	--	--	--
	4	--	--	--
	5	--	--	--
	6	--	--	--
	7	--	--	--
	8	--	--	--
	9	--	--	--

ppb Parts per billion.
-- Not detected.

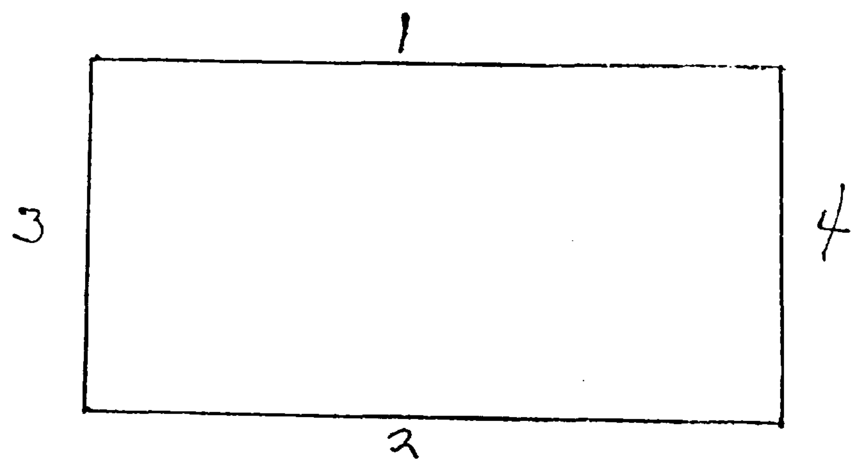
WAH CHANG CORPORATION

Glen Cove, N. Y.

RADIATION SURVEY REPORT

Date Oct 15 1971

Thorium Storage Pit
(located outside the chem lab)



W1	< 10 DPM/100 cm²	M1	< 20 DPM/100 cm²
W2	< 10	M2	< 20
W3	< 10	M3	< 20
W4	< 10	M4	< 20

A Sample from the bottom of the pit shows 150 DPM/100 cm²

Signed [signature]

adiation Officer

104200

WAH CHANG CORPORATION
Glen Cove, N. Y.

RADIATION SURVEY REPORT

Date Oct 14 1971

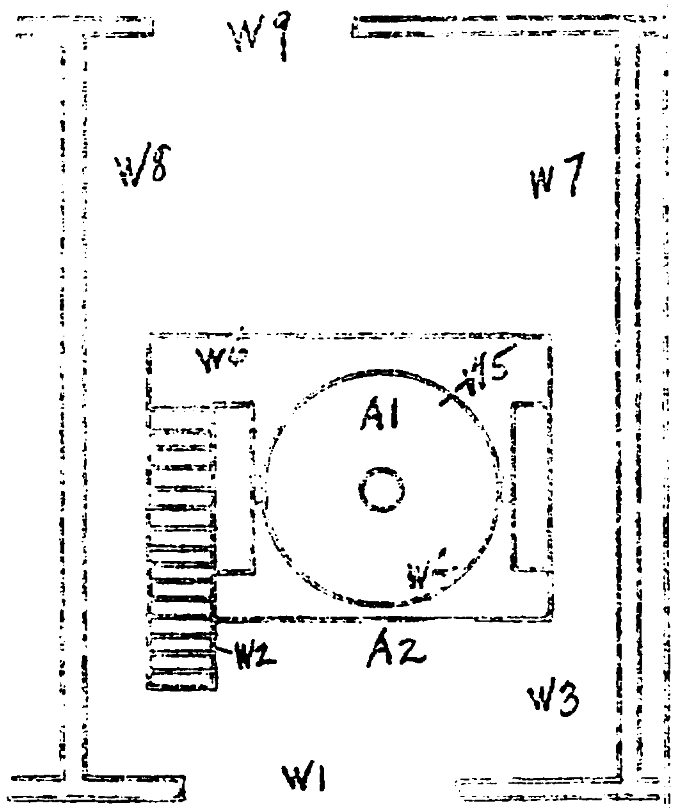
Air Sampling By W Ritchie

Blending Room

Meter Tests By F. H. Lee

WIPE SAMPLES

W1	20	DPM/100cm²
W2	25	DPM
[W3]	20	DPM
W4	30	DPM
W5	25	DPM
W6	20	DPM
W7	20	DPM
[W8]	25	DPM
W9	25	DPM
W10		CPM



SAMSON METER READINGS

M1	40	DPM/100cm²
M2	80	DPM
M3	150	DPM
M4	300	DPM
M5	300	DPM
M6	100	DPM
M7	40	DPM
M8	150	DPM
M9	40	DPM
M10		CPM

AIR SAMPLING STATIONS:

A1 (Loading) at 15CFM, Sampling Time 30 Min., Shows <10 DPM/100cm²

A2 (Unloading) at 15 CFM, Sampling Time 30 Min., Shows <10 DPM/100cm²

Signed [signature]
Radiation Officer

104201

WAH CHANG CORPORATION

Glen Cove, N. Y.

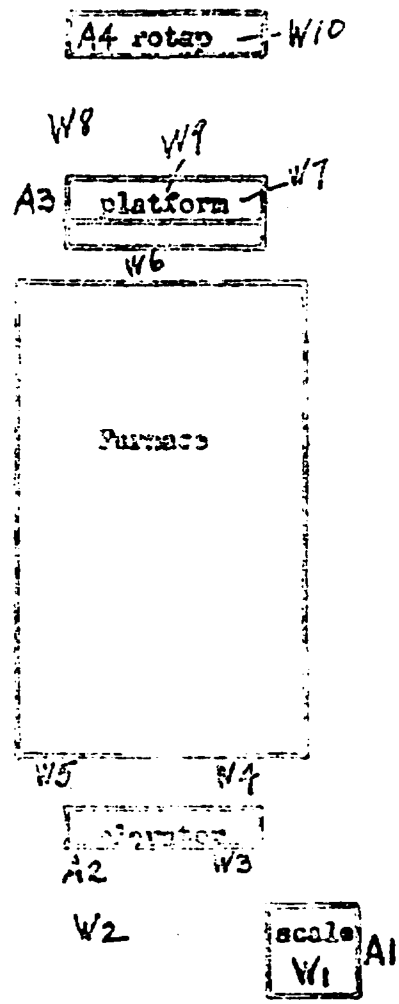
RADIATION SURVEY REPORT

Date Oct 14 1971 Air Sampling By W. Ritchie

Reduction Furnace No. 8 Meter Tests By F. H. Lee

WIPE SAMPLES

W1	<20 DPM/100cm²
W2	<20 DPM
W3	<20 DPM
W4	<20 DPM
W5	<20 DPM
W6	<20 DPM
W7	<20 DPM
W8	<20 DPM
	<20 DPM
W10	<20 DPM



SAMSON METER READINGS

M1	50 DPM/100cm²
M2	25
M3	25
M4	100
M5	25
M6	50
M7	25
M8	25
M9	50
M10	100

AIR SAMPLING STATIONS:

A1 (Weighing) at 15 CFM, Sampling Time 30 Min., Shows <10 DPM/100 cm²

A2 (Elevator) " " " 30 Min., Shows <10 DPM "

A3 (Unloading) " " " 30 Min., Shows <10 DPM "

A4 (Rotap) " " " 30 Min., Shows <10 DPM "

Signed [signature]

Radiation Officer

104202

August 12, 1971

Address Reply To:

Radiological Health Unit

Wah Chang Smelting & Refining Company
63 Herb Hill Road
Glen Cove, New York

Att: Mr. Henry Lee
Radiation Safety Officer

Dear Mr. Lee:

As per our telecon of August 10, 1971, I am enclosing a copy of our instruction sheet for the decon and release of radiation facilities and equipment, in case you have not been able to locate the copy previously left with you in March of this year. As you can see the instructions are quite explicit, however, I wish to clarify one point, namely, the term contamination. As used in the instruction sheet, it applies to both removable (loose) and fixed radioactive surface contamination. Table V specifies the limits for both types of contamination.

There are two known areas of your plant where a final survey will be required. These are:

1. The reduction building where Th NO_3 was used;

2. Thorium storage pit.

If there are any other areas of your facility where radioactive material was used, please include them in the survey.

If I may be of any further assistance to you in this matter, please contact me.

Very truly yours,

Alan H. Jones
Senior Radiophysicist

AHJ:pc
Enclosure

104203

SUPPLEMENTARY DATA

Firm	Wah Chang-Albany Div
Installation #	60464

1. Personnel Dosimetry

a. Whole Body Exposure

Monitoring Period	Type of Dosimeter	Number Monitored	Number of Persons in Dose Range min.det.	min-3 Rem	3-5 Rem	> 5 Rem	Maximum Exposure in Rem
prev. year	None						
year to date							

b. Extremity Exposure

Monitoring Period	Type of Dosimeter	Number Monitored	Number of Persons in Dose Range min.det.	min-25 Rem	25-75 Rem	> 75 Rem	Maximum Exposure in Rem
prev. year	None						
year to date							

c. Internal Exposure

Nuclide of Int.	Bioassay Technique	Sample Freq.	Analyzed By	No. Mon.	Number of Persons in Exp.Range min. det.	0-25% of lim.	25-100% of lim.	> 100% of lim.	Max. Exp.
	None								

2. Surveys

Type	How often performed	Date of latest	Performed By	Results
Radiation Equipment	NA	—		
Radioactive Materials (Sealed)	NA	—		
Radioactive Materials (Unsealed)	not as often as required after processing Th Nos	3/15/69	RSC	OK
Sealed Source Leak Tests	NA	—	—	
Interlocks	NA			

104204

3. Radioactive Material/Equipment Inventory Fluctuations

a. Radioactive Material

Nuclide	Rec'd in past 12 mons.	Removed from Facility in Past 12 Months			
		non-waste	waste		
	activity	activity	activity	physical form	vendor/method
$Th(NO_3)_4$	1874 lbs = .09 Ci	[illegible]	None		

b. Equipment

Received		Disposed of	
Type	Description (kVp, beam current)	Type	Where
None			

4. Evaluation of Health Physics Program based on above data and attached instrument/smear survey with any general comment:

I suggested to RSO that ThO in pit be disposed of if it is not going to be used.

RSO assumes that someone else would take surveys when Th powder is processed. It was pointed out to him that it is his responsibility to see that it gets done. He says he will do so.

By [signature]

Date 11/30/70

AHJ:pc
11-70

SURVEY RESULTS

LR 368 30 Lab. Page 2113

Firm [illegible] Install # [illegible] ☐ Sealed ☒ Unsealed

# of Samples 16 ☐ Q tip; ☒ Filter; ☐ Other Nuclides Th Survey Date 11/3?/70 Radiophysicist [illegible]

αβ [illegible]

4318 DO #	SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET	ACTIVITY (pCi)	REMARKS
11	1	21	5	4.20	4.05	9.61	Total α ~ Th 232
12	2	3	5	0.60	0.45	1.07	= 131.51 pCi
13	3	62	5	12.40	12.25	29.05	
14	4	69	5	13.80	13.65	32.40	Actually Std for α std @
15	5	44	5	8.80	8.65	20.53	18% Efficiency
16	6	7	5	1.40	1.25	2.97	Should actually be ~57%
17	7	3	5	0.60	0.45	1.07	(loss due to cover on the Std)
18	8	22	5	4.40	4.25	10.09	∴ These results are
19	9	23	5	4.60	4.45	10.56	probably a factor of 3 high
21	10	1	5	0.20	0.05	0.12	R.F.B.
22	11	1	5	0.20	0.05	0.12	
23	12	2	5	0.40	0.25	0.59	
24	13	9	5	1.80	1.65	3.92	
25	14	8	5	1.60	1.45	3.44	
26	15	9	5	1.80	1.65	3.92	
27	16	5	5	1.00	0.85	2.02	

Count for Alpha vs Th 232 Std, Instrument A-157 4318 Detector [illegible]

Voltage 1200 Gain x 0.4 Date Counted 12-3-70 Radiochemist [illegible] RFB

Background 0.15 CPM; Factor 2.3738 pCi/cpm (net)

[illegible]

Robert F. Blair 12/3/70

SIGNATURE (UNIT REVIEW)

[illegible] 12/4

SIGNATURE (SECTION REVIEW)

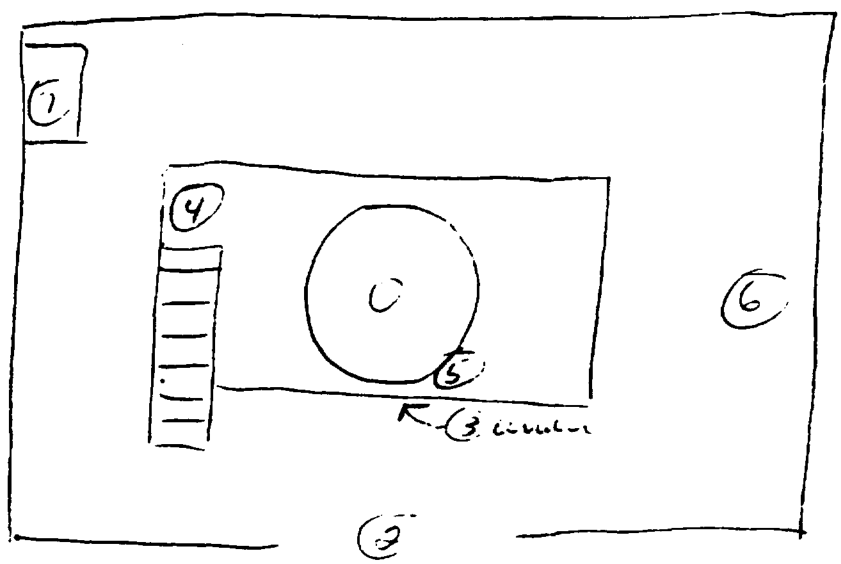
~~E 3-68~~ ~~98~~

DIAGRAM OF SURVEYED AREA

Radiophysicist [illegible]

Installation = 60464 Date 11/30/70

Firm [illegible] Address Glen Cove



① Can in pb storage box

⑧ table in sluicing area
⑨ floor at [illegible]
⑩ hopper
⑪ loading table at #7 furnace
⑫ floor at loading area
⑬ wet screening table
⑭ dust " "
⑮ floor behind #7 furnace
⑯ outside shipping container of th. in warehouse

H: Hard; S: Soft; a: Alpha; n: Neutron
Red Numerals: Radiation in MREM/HR
Green Numerals: Smear Numbers
Blue Circled Smear Numbers: Greater Than 3 x Background Standard Deviation or as Indicated

LMS Compl Assign ~~Nov 69~~

STATE OF NEW YORK – DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL HYGIENE
RADIOLOGICAL HEALTH UNIT
80 Centre Street
New York, N. Y. 10013

EXCELSIOR

NOTICE OF INSPECTION FINDINGS

1. Date
2. Type Visit

3. Firm Name & Address
4. No. Employees Exposed — Male / Female
5. Confines of Installation
6. Registration No.
7. License No.(s)
8. Industrial Code
9. Radiation Safety Officer

10. Findings

☐ A. No item of non-compliance found.

☐ B. The following paragraphs of Code Rule 38 or conditions of your license were found in violation

(47 ☐ 4)		(☐ 23)		(19 ☐ 34.1)	
(☐ 5.1)		(47 ☐ 24)		(20 ☐ 34.2)	
(☐ 6.2)		(47 ☐ 25)		(21 ☐ 34.3)	
(☐ 9.1)		(15 ☐ 26.2)		(47 ☐ 34.4)	
(☐ 9.1)		(15 ☐ 26.3)		(☐ 35.1)	
(☐ 9.1)		(15 ☐ 26.4)		(47 ☐ 35.2)	
(47 ☐ 10)		(30 ☐ 26.5)		(25 ☐ 36.1a)	
(47 ☐ 11)		(47 ☐ 26.6)		(9 ☐ 36.1b)	
(47 ☐ 20)		(47 ☐ 28)		(24 ☐ 36.1c)	
(10 ☐ 21.1)		(16 ☐ 30)	81	(47 ☐ 36.2)	[redacted]
(11 ☐ 21.2)	81	(☐ 31.2)	81	(28 ☐ 37)	
(13 ☐ 22.1)	controlled area	(18 ☐ 32)		(31 ☐ 39)	
(14 ☐ 22.2)		(18 ☐ 33)	81	(☐)	
(☐)		(☐)		(☐)	

11. Remarks

104208

12. The violations indicated above should be removed within ______ days.

13. Signature of Department Representative

FOR THE COMMISSIONER

IH-317.1 (8-65)

14. DATE	15. REVIEWED BY	16. DISPOSITION

REPORT ON COMPLIANCE VISIT

17. DATE	18. PERSON CONTACTED	19. REASON FOR NON-COMPLIANCE
12/17/69	Henry Lee	22.1 - Thorium nitrate cans placed into lead lined box in "Xmas tree" area. (< 2 mr/hr) 31.2 32 } I.C. 26.1

1. DATE CASE CLOSED 12/17/69 21. INITIALS L.M.-S.

104209

9/3/69
Wah Chang-Smith + Refg Co.
L0464 Glen Cove, L.I.

SUPPLEMENTARY DATA

1. Personnel Dosimetry None

a. Whole Body Exposure

Monitoring Period	Type of Dosimeter	Number Monitored	Number of Persons in Dose Range				Maximum Exposure in Rem
			min.det.	min-3 Rem	3-5 Rem	> 5 Rem	
prev. year	None (used film badges years ago when working with						
year to date	in uranium oxide) (Atomic Film Badge - L.T.C.)						

b. Extremity Exposure

Monitoring Period	Type of Dosimeter	Number Monitored	Number of Persons in Dose Range				Maximum Exposure in Rem
			min.det.	min-25 Rem	25-75 Rem	> 75 Rem	
prev. year	None						
year to date							

c. Internal Exposure

Nuclide of Int.	Bioassay Technique	Sample Freq.	Analyzed By	No. Mon.	Number of Persons in Exp. Range				Max. Exp.
					min. det.	0-25% of lim.	25-100% of lim.	> 100% of lim.	
	None								
(Used to take blood tests when working with thorium oxide)									

2. Surveys

Type	How often performed	Date of latest	Performed By	Results (in excess of limits, etc.)
Radiation Equipment	N.A.			
Radioactive Materials (Sealed)	N.A.			
Radioactive Materials (Unsealed)	when working with thorium (wipes + air samples)	3/16/69 Previous 1/15/69	Henry Lee	O.K. ([illegible])
Sealed Source Leak Tests	N.A.			
Interlocks	N.A.			

104210

3. Radioactive Material/Equipment Inventory Fluctuations

a. Radioactive Material

Nuclide	Rec'd in past 12 mons. activity	Removed from Facility in Past 12 Months			
		non-waste		waste	
		activity	activity	physical form	vendor/method
Thorium	7/31/68 400 lbs	Used in product		None	
232	12/15/68 400	1968	460 lbs		
	6/16/69 400 7/12/69 460	1969 (to date)	470 "		
	1260		930		
On hand at present abt. 250 lbs. in original containers					

b. Equipment

Received		Disposed of	
Type	Description (kVp, beam current)	Type	Where
N.A.			

4. Evaluation of Health Physics Program based on above data and attached instrument/smear survey with any general comment:

There is some Thorium Oxide scrap (residue) buried in a pit with a heavy concrete locked cover on it in the yard. Marked with a radiation area sign. They have not used the oxide for several years. Now only Thorium nitrate used in their process. Their Nuclear Chicago Model 2612 is presently not operable. However they also have a "El-Tronics" Scintillation Scaler Model LS 64-83. 18 wipes were taken to-day. Also to-days surveys showed < 1 mr/hr all around the blenders + the furnaces, < 2 mr/hr at 1 ft above the cover of the pit, but 5 mr/hr in the vicinity of the unopened containers of thorium nitrate stored in the warehouse. They will rearrange these containers and post a radiation area sign.

Lester M. Johnston

Da[te] Sept 3 1969

AHJ:pc
4-69

SURVEY RESULTS

LR - 224 - 69 Lab. Page 1995

Firm Wah Chang S+R, Glen Cove, N.Y. Install # L0464 ☐ Sealed; ☒ Unsealed

# of Samples 18 ☐ Q tip; ☒ Filter; ☐ Other Nuclides ^{232}Th Survey Date 9/3/69 Radiophysicist L. Schu[illegible]

4318 pos#	SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET ±σ	ACTIVITY (pCi) ±3σ	REMARKS
55	1	535	15	35.67	31.27 ±2.00	27.91 ±5.35	See diagram
56	2	1,272	15	84.80	80.40 ±2.99	71.76 ±8.01	
57	3	273	15	18.20	13.80 ±1.50	12.32 ±4.02	
58	4	301	15	20.07	15.67 ±1.56	13.99 ±4.18	
59	5	319	15	21.27	16.87 ±1.60	15.06 ±4.28	
61	6	162	15	10.80	6.40 ±1.23	5.71 ±3.29	
62	7	117	15	7.80	3.40 ±1.10	3.03 ±2.95	
63	8	90	15	6.00	1.60 ±1.02	1.43 ±2.73	
64	9	62	15	4.13	-0.27 ±0.92	-0.24 ±2.46	
65	10	119	15	7.93	3.53 ±1.11	3.15 ±2.97	
66	11	99	15	6.60	2.20 ±1.05	1.96 ±2.81	
67	12	54	15	3.60	-0.80 ±0.89	-0.71 ±2.38	
68	13	62	15	4.13	-0.27 ±0.92	-0.24 ±2.46	
69	14	92	15	6.13	1.73 ±1.03	1.54 ±2.76	
71	15	98	15	6.54	2.14 ±1.05	1.91 ±2.81	(In Furnace Room) Cross car with blended powder inc.
72	16	28	5	5.60	1.20 ±1.00	1.07 ±2.68	16
73	17	38	5	7.60	3.20 ±1.10	2.86 ±2.95	Warehouse - Unopened shipping container with unblended Th. Nitrate
74	18	30	7.5	4.00	-0.40 ±0.92	-0.30 ±2.46	Floor near containers.

Count for α+β vs Cs^{137} Std, Instrument 4318 S-104 Detector P-10 gas, prop. Windowless

Voltage 2000 Gain α 5.4 unfeasible Date Counted 9/11-15/69 Radiochemist RFB/LSC

Background 4.40 CPM; Factor Cs^{137} = 0.8925 pCi/cpm (net) Total α+β no Cs^{137} Std = 163.70 pCi α+β

of 10

$3\bar{\sigma}$ = 2.6774

Robert F. Blair 10/6/69
SIGNATURE (UNIT REVIEW)

D. Edward Stein 10/6
SIGNATURE (SECTION REVIEW)

IH-375 (12-66)

104212

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTIN

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C880826/11 04/15/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/08/88 RECEIVED:04/08/88

SAMPLE: Water sample, GM-9

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1	Chlorobenzene	ug/L	<1
Bromomethane	ug/L	<1	13 Dichlorobenzene	ug/L	<2
Dichlordifluomethane	ug/L	<1	12 Dichlorobenzene	ug/L	<2
Vinyl Chloride	ug/L	32	14 Dichlorobenzene	ug/L	<2
Chloroethane	ug/L	<1	Benzene	ug/L	<1
Methylene Chloride	ug/L	<2	Toluene	ug/L	<2
Trichlorofluomethane	ug/L	<2	Ethyl Benzene	ug/L	<1
11 Dichloroethene	ug/L	<2	m Xylene	ug/L	<2
11 Dichloroethane	ug/L	<2	o+p Xylene	ug/L	<4
12 Dichloroethene	ug/L	220			
Chloroform	ug/L	<1	Calcium as Ca	mg/L	55
12 Dichloroethane	ug/L	<2	Cobalt as Co	mg/L	<0.0
111 Trichloroethane	ug/L	2	Nickel as Ni	mg/L	<0.1
Carbon Tetrachloride	ug/L	<1	Sodium as Na	mg/L	34
Bromodichloromethane	ug/L	<1	Mercury as Hg	mg/L	<0.0
12 Dichloropropane	ug/L	<2	Lead as Pb	mg/L	<0.0
t 13 Dichloropropene	ug/L	<2	Chromium as Cr	mg/L	<0.0
Trichloroethylene	ug/L	140	Cadmium as Cd	mg/L	<0.0
Chlorodibromomethane	ug/L	<1	Arsenic as As	mg/L	<0.0
112 Trichloroethane	ug/L	<2	Tantalum	mg/L*	0.11
c 13 Dichloropropene	ug/L	<2	Tungsten	mg/L*	<0.1
2chloroethvinylether	ug/L	<2	Chloride as Cl	mg/L	43
Bromoform	ug/L	<2	Nitrate as N	mg/L	1.0
1122Tetrachloroethan	ug/L	<2	Sulfate as SO4	mg/L	150
Tetrachloroethene	ug/L	1600			

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.

DIRECTOR

rn= 3089

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO. C880399/1 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D: 04/15/88 RECEIVED: 04/18/88

SAMPLE: Water sample, GM-10

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlorodifluomethane	ug/L	<1
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<2
Trichlorofluomethane	ug/L	<2
11 Dichloroethene	ug/L	11
11 Dichloroethane	ug/L	4
12 Dichloroethene	ug/L	65
Chloroform	ug/L	<1
12 Dichloroethane	ug/L	<2
111 Trichloroethane	ug/L	200
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
12 Dichloropropane	ug/L	<2
t 13 Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	58
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c 13 Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	30

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
13 Dichlorobenzene	ug/L	<1
12 Dichlorobenzene	ug/L	<1
14 Dichlorobenzene	ug/L	<1
Benzene	ug/L	<1
Toluene	ug/L	<1
Ethyl Benzene	ug/L	<1
m + p Xylene	ug/L	<2
o Xylene	ug/L	<1

cc:

REMARKS:

Page 1 of 2.

DIRECTOR [signature]

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C8802899/1 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-10

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
Calcium as Ca	mg/L	21	
Cobalt as Co	mg/L	0.024	
Nickel as Ni	mg/L	<0.10	
Sodium as Na	mg/L	12	
Mercury as Hg	mg/L	<0.00025	
Lead as Pb	mg/L	<0.005	
Chromium as Cr	mg/L	<0.005	
Cadmium as Cd	mg/L	<0.001	
Arsenic as As	mg/L	<0.002	
Tantalum	mg/L*	<0.01	
Tungsten	mg/L*	0.40	
Chloride as Cl	mg/L	14	
Nitrate as N	mg/L	26	
Sulfate as SO4	mg/L	48	
Spec. Cond. umho/cm		260	
pH	units	5.6	

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.
Page 2 of 2.

DIRECTOR [signature]

rr= 3432

104215

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTIN

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C880899/2 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-11

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<1
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<2
Trichlorofluomethane	ug/L	<2
11 Dichloroethene	ug/L	<2
11 Dichloroethane	ug/L	<2
12 Dichloroethene	ug/L	<2
Chloroform	ug/L	<1
12 Dichloroethane	ug/L	<2
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
12 Dichloropropane	ug/L	<2
t 13 Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	<1
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c 13 Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	<1

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
13 Dichlorobenzene	ug/L	<1
12 Dichlorobenzene	ug/L	<1
14 Dichlorobenzene	ug/L	<1
Benzene	ug/L	<1
Toluene	ug/L	<1
Ethyl Benzene	ug/L	<1
m + p Xylene	ug/L	<2
o Xylene	ug/L	<1

cc:

REMARKS:

DIRECTOR

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C880899/2 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-11

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
Calcium as Ca	mg/L	25	
Cobalt as Co	mg/L	<0.005	
Nickel as Ni	mg/L	<0.10	
Sodium as Na	mg/L	14	
Mercury as Hg	mg/L	<0.00025	
Lead as Pb	mg/L	<0.005	
Chromium as Cr	mg/L	<0.005	
Cadmium as Cd	mg/L	<0.001	
Arsenic as As	mg/L	<0.002	
Tantalum	mg/L*	<0.01	
Tungsten	mg/L*	0.11	
Chloride as Cl	mg/L	22	
Nitrate as N	mg/L	3.5	
Sulfate as SO4	mg/L	50	
Spec. Cond. umho/cm		240	
pH	units	6.2	

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.
Page 2 of 2.

DIRECTOR [signature]

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C880899/2 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-11

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1	Chlorobenzene	ug/L	<1
Bromomethane	ug/L	<1	13 Dichlorobenzene	ug/L	<1
Dichlordifluomethane	ug/L	<1	12 Dichlorobenzene	ug/L	<1
Vinyl Chloride	ug/L	<1	14 Dichlorobenzene	ug/L	<1
Chloroethane	ug/L	<1	Benzene	ug/L	<1
Methylene Chloride	ug/L	<2	Toluene	ug/L	<1
Trichlorofluomethane	ug/L	<2	Ethyl Benzene	ug/L	<1
11 Dichloroethene	ug/L	<2	m + p Xylene	ug/L	<2
11 Dichloroethane	ug/L	<2	o Xylene	ug/L	<1
12 Dichloroethene	ug/L	<2			
Chloroform	ug/L	<1			
12 Dichloroethane	ug/L	<2			
111 Trichloroethane	ug/L	<1			
Carbon Tetrachloride	ug/L	<1			
Bromodichloromethane	ug/L	<1			
12 Dichloropropane	ug/L	<2			
t 13 Dichloropropene	ug/L	<2			
Trichloroethylene	ug/L	<1			
Chlorodibromomethane	ug/L	<1			
112 Trichloroethane	ug/L	<2			
c 13 Dichloropropene	ug/L	<2			
2chloroethvinylether	ug/L	<2			
Bromoform	ug/L	<2			
1122Tetrachloroethan	ug/L	<2			
Tetrachloroethene	ug/L	<1			

cc:

REMARKS:

DIRECTOR

3379

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTIN

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.CR00899/3 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-12

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<1
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<2
Trichlorofluomethane	ug/L	<2
11 Dichloroethene	ug/L	<2
11 Dichloroethane	ug/L	<2
12 Dichloroethene	ug/L	<2
Chloroform	ug/L	<1
12 Dichloroethane	ug/L	<2
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
12 Dichloropropane	ug/L	<2
13 Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	<1
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c 13 Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	<1

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
13 Dichlorobenzene	ug/L	<1
12 Dichlorobenzene	ug/L	<1
14 Dichlorobenzene	ug/L	<1
Benzene	ug/L	<1
Toluene	ug/L	<1
Ethyl Benzene	ug/L	<1
m + p Xylene	ug/L	<2
o Xylene	ug/L	<1

cc:

REMARKS:

Page 1 of 2.

DIRECTOR [signature]

rn: 3399

104219

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C880899/3 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-12.

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
Calcium as Ca	mg/L	110	
Cobalt as Co	mg/L	<0.005	
Nickel as Ni	mg/L	<0.10	
Sodium as Na	mg/L	27	
Mercury as Hg	mg/L	<0.00025	
Lead as Pb	mg/L	<0.005	
Chromium as Cr	mg/L	<0.005	
Cadmium as Cd	mg/L	<0.001	
Arsenic as As	mg/L	<0.002	
Tantalum	mg/L*	<0.01	
Tungsten	mg/L*	<0.01	
Chloride as Cl	mg/L	65	
Nitrate as N	mg/L	<0.5	
Sulfate as SO4	mg/L	150	
Spec. Cond. umho/cm		790	
pH	units	6.2	

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.
Page 2 of 2.

DIRECTOR [signature]

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO. C883899/4 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-13

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<1
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<2
Trichlorofluomethane	ug/L	<2
11 Dichloroethene	ug/L	<2
11 Dichloroethane	ug/L	<2
12 Dichloroethene	ug/L	13
Chloroform	ug/L	<1
12 Dichloroethane	ug/L	<2
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
12 Dichloropropane	ug/L	<2
t 13 Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	5
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c 13 Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	<1

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
13 Dichlorobenzene	ug/L	<1
12 Dichlorobenzene	ug/L	<1
14 Dichlorobenzene	ug/L	<1
Benzene	ug/L	<1
Toluene	ug/L	<1
Ethyl Benzene	ug/L	<1
m + p Xylene	ug/L	<2
o Xylene	ug/L	<1

cc:

REMARKS:

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO. C880879/4 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-13

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
Calcium as Ca	mg/L	120	
Cobalt as Co	mg/L	0.040	
Nickel as Ni	mg/L	<0.10	
Sodium as Na	mg/L	96	
Mercury as Hg	mg/L	<0.00025	
Lead as Pb	mg/L	<0.005	
Chromium as Cr	mg/L	<0.005	
Cadmium as Cd	mg/L	<0.001	
Arsenic as As	mg/L	0.002	
Tantalum	mg/L*	<0.01	
Tungsten	mg/L*	<0.01	
Chloride as Cl	mg/L	25	
Nitrate as N	mg/L	<0.5	
Sulfate as SO4	mg/L	430	
Spec. Cond. umho/cm		1060	
pH	units	6.1	

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.
Page 2 of 2.

DIRECTOR

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C880899/5 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-14A

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<1
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<2
Trichlorofluomethane	ug/L	<2
11 Dichloroethene	ug/L	<2
11 Dichloroethane	ug/L	<2
12 Dichloroethene	ug/L	<2
Chloroform	ug/L	<1
12 Dichloroethane	ug/L	<2
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
12 Dichloropropane	ug/L	<2
t 13 Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	<1
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c 13 Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	<1

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
13 Dichlorobenzene	ug/L	<1
12 Dichlorobenzene	ug/L	<1
14 Dichlorobenzene	ug/L	<1
Benzene	ug/L	<1
Toluene	ug/L	<1
Ethyl Benzene	ug/L	3
m + p Xylene	ug/L	<2
o Xylene	ug/L	<1

cc:

REMARKS:

DIRECTOR Thomas R. [signature]

3302

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTI

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO. C880899/5 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/19/88

SAMPLE: Water sample, GM-14A

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
Calcium as Ca	mg/L	370	
Cobalt as Co	mg/L	0.40	
Nickel as Ni	mg/L	0.20	
Sodium as Na	mg/L	6,600	
Mercury as Hg	mg/L	<0.00025	
Lead as Pb	mg/L	0.070	
Chromium as Cr	mg/L	0.050	
Cadmium as Cd	mg/L	<0.002	
Arsenic as As	mg/L	0.78	
Tantalum	mg/L*	2.26	
Tungsten	mg/L*	39.40	
Chloride as Cl	mg/L	700	
Nitrate as N	mg/L	1.0	
Sulfate as SO4	mg/L	11000	
Spec. Cond. umho/cm		20,200	
pH	units	7.4	

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.
Page 2 of 2.

DIRECTOR

3436

104224

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTIN(

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C280899/6 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-15

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<1
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<2
Trichlorofluomethane	ug/L	<2
11 Dichloroethene	ug/L	<2
11 Dichloroethane	ug/L	<2
12 Dichloroethene	ug/L	<2
Chloroform	ug/L	<1
12 Dichloroethane	ug/L	<2
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
12 Dichloropropane	ug/L	<2
t 13 Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	<1
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c 13 Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	<1

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
13 Dichlorobenzene	ug/L	<1
12 Dichlorobenzene	ug/L	<1
14 Dichlorobenzene	ug/L	<1
Benzene	ug/L	<1
Toluene	ug/L	<1
Ethyl Benzene	ug/L	<1
m + p Xylene	ug/L	<2
o Xylene	ug/L	<1

cc:

REMARKS:

DIRECTOR Thomas R. [illegible]

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO. C080879/6 04/27/08

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342L101
COLLECTED BY: Client DATE COL'D:04/15/08 RECEIVED:04/18/08

SAMPLE: Water sample, GM-15

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
Calcium as Ca	mg/L	48	
Cobalt as Co	mg/L	0.030	
Nickel as Ni	mg/L	<0.10	
Sodium as Na	mg/L	48	
Mercury as Hg	mg/L	<0.00025	
Lead as Pb	mg/L	<0.005	
Chromium as Cr	mg/L	<0.005	
Cadmium as Cd	mg/L	<0.001	
Arsenic as As	mg/L	0.002	
Tantalum	mg/L*	<0.01	
Tungsten	mg/L*	0.16	
Chloride as Cl	mg/L	120	
Nitrate as N	mg/L	<0.5	
Sulfate as SO4	mg/L	48	
Spec. Cond. umho/cm		640	
pH	units	6.2	

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.
Page 2 of 2.

DIRECTOR

3437

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTING

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C880877/7 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-16

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<1
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<2
Trichlorofluomethane	ug/L	<2
11 Dichloroethene	ug/L	<2
11 Dichloroethane	ug/L	<2
12 Dichloroethene	ug/L	<2
Chloroform	ug/L	<1
12 Dichloroethane	ug/L	<2
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
12 Dichloropropane	ug/L	<2
t 13 Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	<1
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c 13 Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	<1

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
13 Dichlorobenzene	ug/L	<1
12 Dichlorobenzene	ug/L	<1
14 Dichlorobenzene	ug/L	<1
Benzene	ug/L	<1
Toluene	ug/L	<1
Ethyl Benzene	ug/L	<1
m + p Xylene	ug/L	<2
o Xylene	ug/L	<1

cc:

REMARKS:

Page 1 of 2.

DIRECTOR

3384

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTIN

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO. C800899/7 04/27/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/15/88 RECEIVED:04/18/88

SAMPLE: Water sample, GM-16

ANALYTICAL PARAMETERS			ANALYTICAL PARAMETERS
Calcium as Ca	mg/L	14	
Cobalt as Co	mg/L	0.010	
Nickel as Ni	mg/L	<0.10	
Sodium as Na	mg/L	7.9	
Mercury as Hg	mg/L	<0.00025	
Lead as Pb	mg/L	<0.005	
Chromium as Cr	mg/L	<0.005	
Cadmium as Cd	mg/L	0.007	
Arsenic as As	mg/L	<0.002	
Tantalum	mg/L*	<0.01	
Tungsten	mg/L*	<0.01	
Chloride as Cl	mg/L	8	
Nitrate as N	mg/L	<0.5	
Sulfate as SO4	mg/L	200	
Spec. Cond. umho/cm		140	
pH units		6.2	

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.
Page 2 of 2.

104228

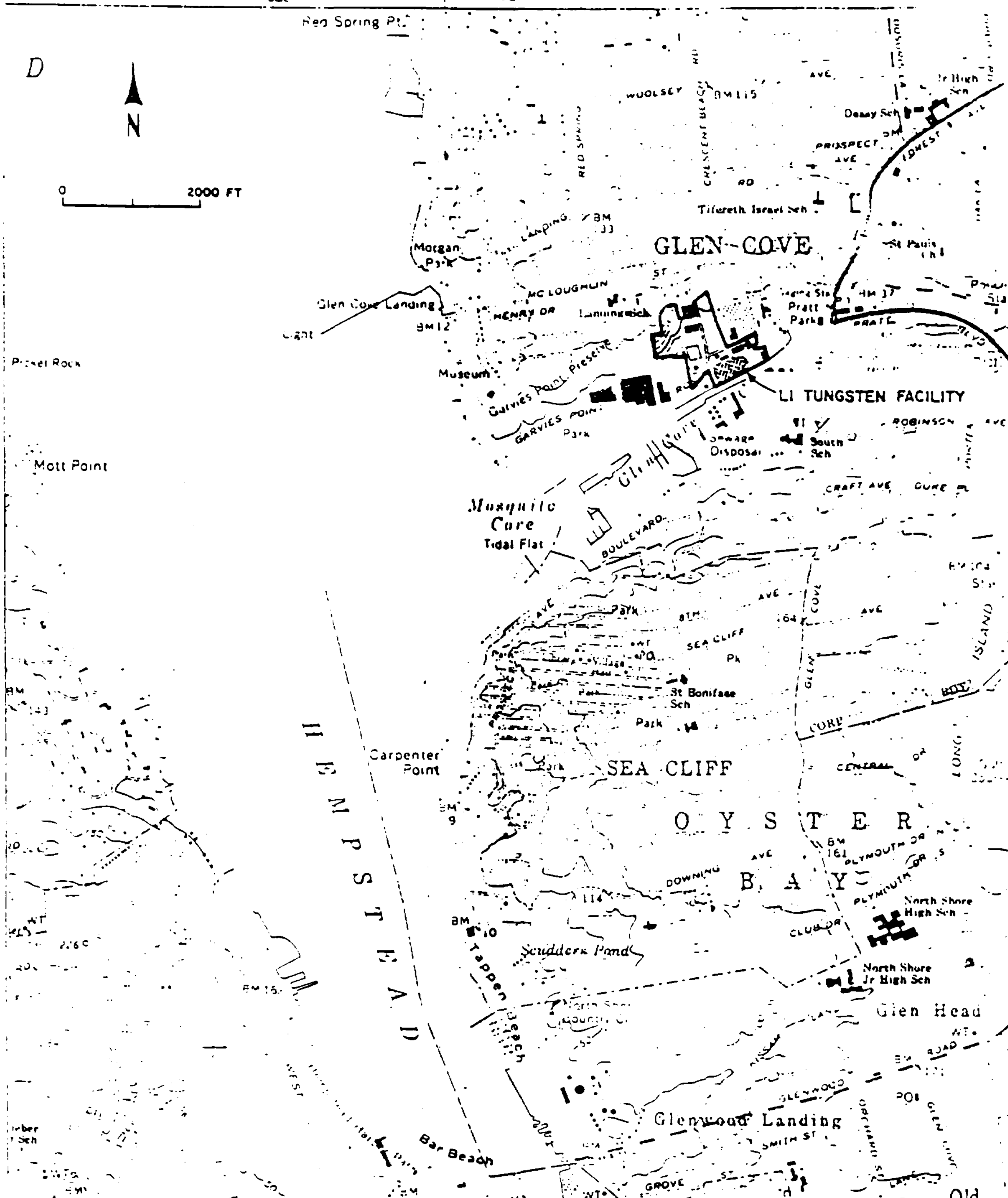
DIRECTOR [signature]

FIGURES

104230

GERAGHTY & MILLER, INC. Ground-Water Consultants	COMPILED BY V. GLASSER	DATE 4-88	SCALE SHOWN
	PREPARED BY G. SCHAFFNER	FILE NO. NI342L2-1047	
	PROJECT MGR. V. GLASSER		

PREPARED FOR: RTP ENVIRONMENTAL ASSOC., INC.
Glen Cove, New York



SUBJECT:

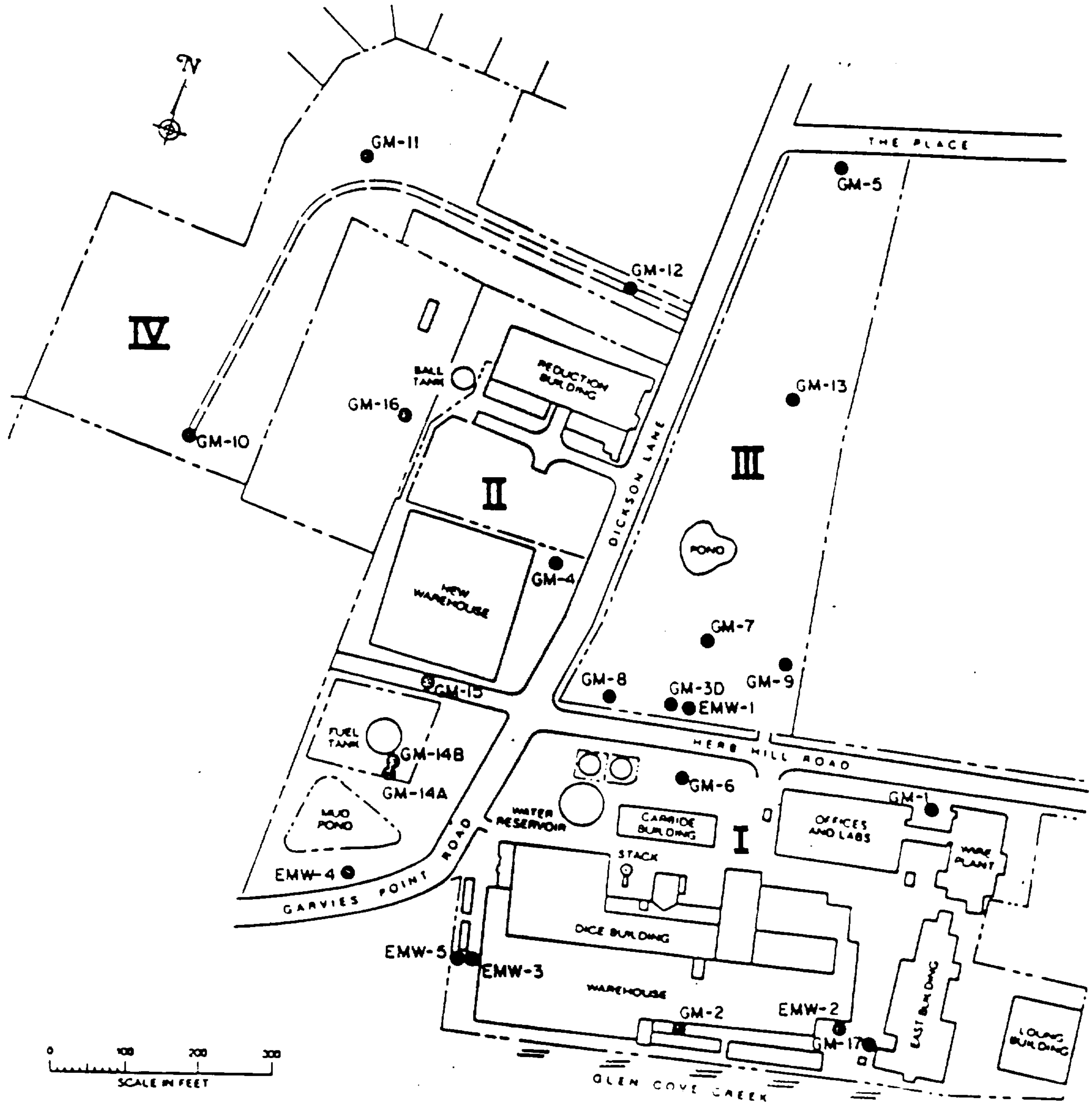
SITE LOCATION, LI TUNGSTEN FACILITY, GLEN COVE, NEW YORK

FIGURE 1

132720

GERAGHTY & MILLER, INC.
Ground-Water Consultants

COMPILED BY: V. GLASSER	DATE: 4-88	SCALE: SHOWN	PREPARED FOR: RTP ENVIRONMENTAL ASSOC., INC. Glen Cove, New York
PREPARED BY: G. SCHAFFNER	FILE NO: N1342LI1-1047		
PROJECT MGR: V. GLASSER			



EXPLANATION

II PARCEL NUMBER

● MONITORING WELL LOCATION

PROPERTY/PARCEL BOUNDARY

DIRT ROAD

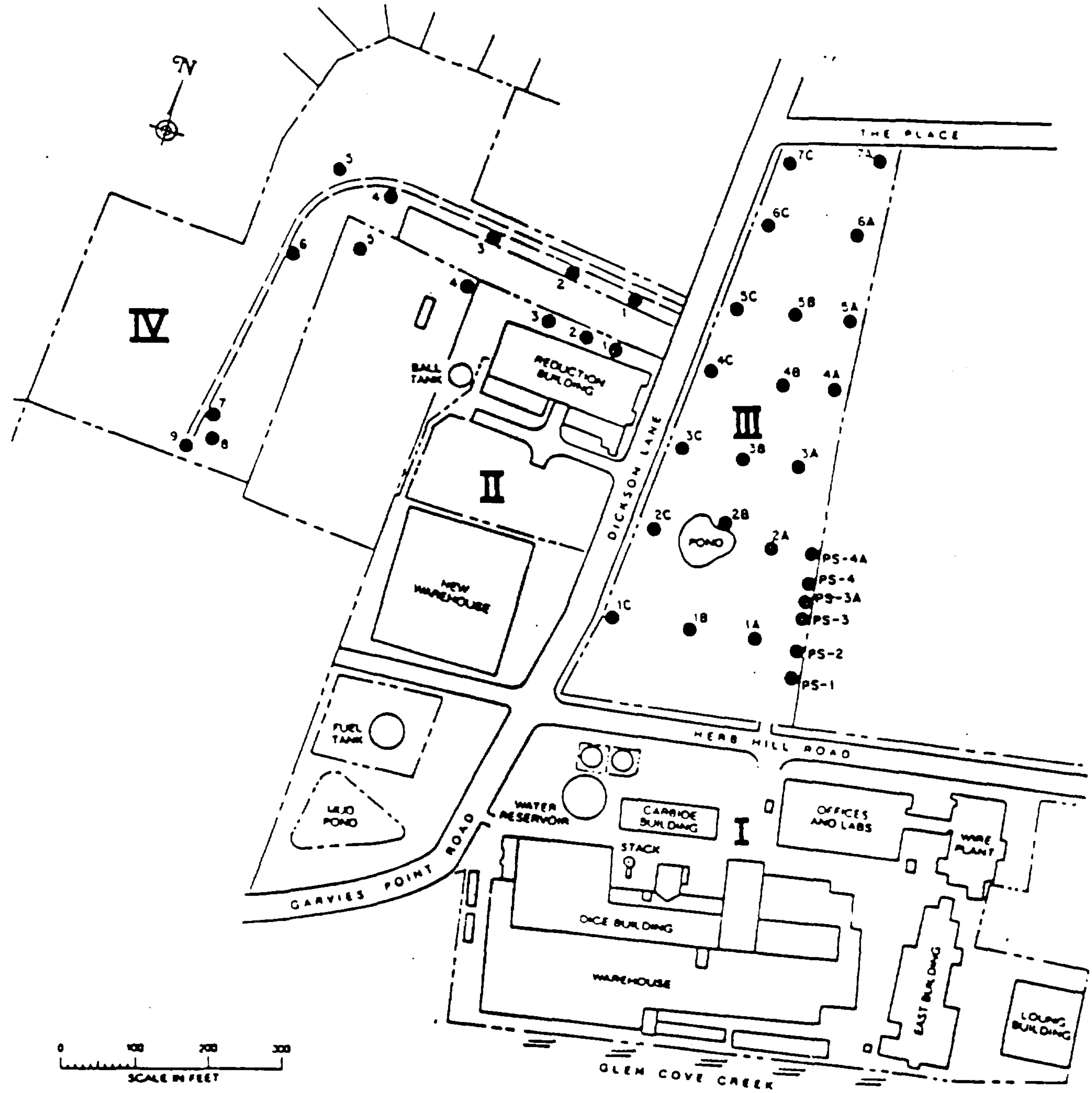
104231

SUBJECT: LOCATION OF MONITORING WELLS, LI TUNGSTEN FACILITY, GLEN COVE, NEW YORK

FIGURE 2

GERAGHTY & MILLER, INC.
Ground-Water Consultants

COMPILED BY: V. GLASSER	DATE: 4-88	SCALE: SHOWN	PREPARED FOR: RTP ENVIRONMENTAL ASSOC., INC. Glen Cove, New York
PREPARED BY: S. SCHAFFNER	FILE NO: N1342L11-1047		
PROJECT MGR: V. GLASSER			



EXPLANATION

II	PARCEL NUMBER	● 1A	SAMPLING LOCATION
— - - —	PROPERTY/PARCEL BOUNDARY	═══	DIRT ROAD

104232

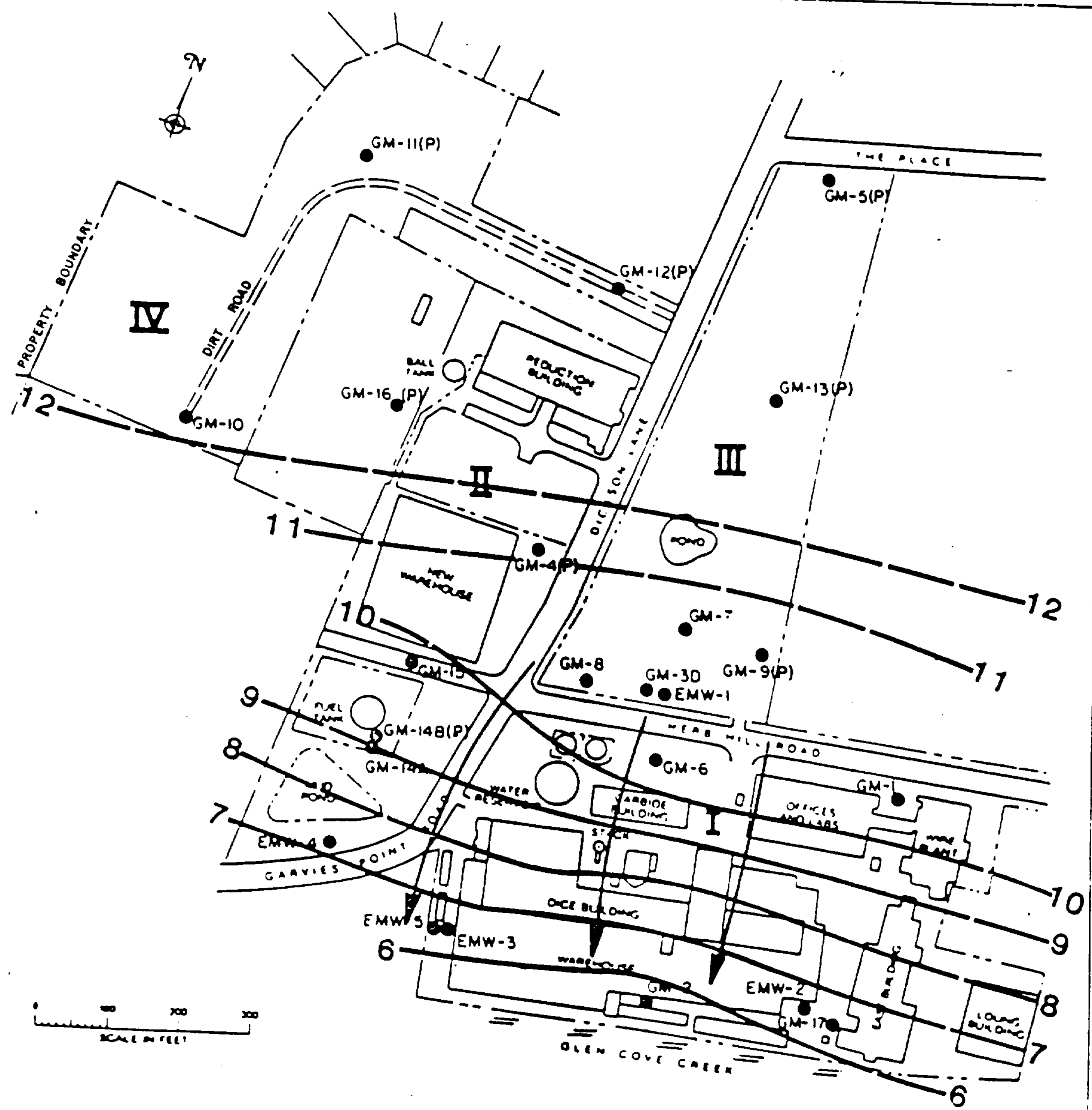
SUBJECT: SOIL SURVEY SAMPLING LOCATIONS, LI TUNGSTEN FACILITY, GLEN COVE, NEW YORK

FIGURE 3

132720

GERAGHTY & MILLER, INC.
Ground-Water Consultants

COMPILED BY: V. GLASSER	DATE: 4-88	SCALE: SHOWN	PREPARED FOR: RTP ENVIRONMENTAL ASSOC., INC. Glen Cove, New York
PREPARED BY: G. SCHAFFNER	FILE NO: NI342LII-1047		
PROJECT MGR: V. GLASSER			



EXPLANATION

II	PARCEL NUMBER	●	MONITORING WELL LOCATION
⟵	DIRECTION OF HORIZONTAL COMPONENT OF GROUND-WATER FLOW	(P)	MONITORING WELL INSTALLED IN PERCHED GROUND-WATER SYSTEM
		—6	LINE OF EQUAL WATER-TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL (DASHED WHERE INFERRED)

NOTE: REFER TO TABLE 2 FOR WATER LEVEL ELEVATIONS MEASURED IN MONITORING WELLS ON 4-26-88

SUBJECT

CONFIGURATION OF THE WATER TABLE ON APRIL 26, 1988

FIGURE 4

104233

SURVEY RESULTS

LR 224 69 Lab. Page 1996

Firm Wah Chang S + R Glen Cove, NY Install # L-04464 Sealed: [X] Unsealed

# of Samples 18 [ ] Q tip; [X] Filter; [ ] Other Nuclides Th^{232} Survey Date 9/3/69 Radiophysicist LS

	SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET ± σ	ACTIVITY (pCi) ± 3σ	REMARKS
1815 / 2001#							
55	1	179	10	17.90	17.25 ± 1.36	14.98 ± 3.54	Otter 4318 Ctg:
56	2	499	10	49.90	49.25 ± 2.25	42.77 ± 5.86	
57	3	86	10	8.60	7.95 ± 0.96	6.90 ± 2.50	Beta – roughly same
58	4	71	10	7.10	6.45 ± 0.84	5.60 ± 2.19	as α + β – α w/ Cs^{137}
59	5	88	10	8.80	8.15 ± 0.97	7.08 ± 2.53	becomes ~ 1/2 as much
61	6	38	10	3.80	3.15 ± 0.67	2.74 ± 1.75	to Cs^{137} std as α + β results
62	7	12	10	1.20	0.55 ± 0.78	0.48 ± 2.03	on P. 1995
63	8	26	10	2.60	1.95 ± 0.57	1.69 ± 1.49	
64	9	8	10	0.80	0.15 ± 0.38	0.13 ± 0.99	I maint. SVBO as
65	10	21	10	2.10	1.45 ± 0.52	1.26 ± 1.35	Th β's too low in energy
66	11	8	10	0.80	0.15 ± 0.38	0.13 ± 0.99	to effectively penetrate
67	12	18	10	1.80	1.15 ± 0.49	1.00 ± 1.28	shielding between
68	13	29	10	2.90	2.25 ± 0.60	1.95 ± 1.56	detector & plastic
69	14	13	10	1.30	0.65 ± 0.44	0.56 ± 1.15	β scintillator on
71	15	14	10	1.40	0.75 ± 0.45	0.65 ± 1.17	4318 system
72	16	6	10	0.60	-0.05 ± 0.35	-0.04 ± 0.91	
73	17	20	10	2.00	1.35 ± 0.51	1.17 ± 1.33	See also TLC data
74	18	4	10	0.40	-0.25 ± 0.32	-0.22 ± 0.83	P. 1998

Count for α vs Ra^{226} Std, Instrument 4318 A-104 Detector P-10 gas, Prop. Windowless

Voltage 1200 Gain α 5.4 inoperable Date Counted 9/16-17/69 Radiochemist RFR/LSC

Background 0.65 CPM; Ra^{226} Factor $_2$ = 0.8685 pCi/cpm (net) Total α vs Ra^{226} – 97.09 pCi Th

0/10

$3F_2$ = 2.6055

Robert F. Glass 10/6/69
SIGNATURE (UNIT REVIEW)

D. Edwards Ten 10/6
SIGNATURE (SECT. REVIEW)

IH-375 (12-66)

104234

TNC analysis!

SURVEY RESULTS

LR 224 69 Lab. Page 1998

Firm Wah Chang S&R Glen Cove N.Y. Install # L-0464 Sealed: [X] Unsealed

# of Samples 18 [ ] Q tip; [X] Filter; [ ] Other Nuclides Th^{232} Survey Date 9/3/69 Radiophysicist LS

SAMPLE #	GROSS COUNTS	T (MIN)	CPM GROSS	CPM NET	ACTIVITY (pCi) ± 3σ	REMARKS
The 18 fps as a group were subjected to TNC analysis on 9/11/69 " 0-2.0 Mev in 1/2; 1.0 min net, DT<0.5%, to 10^2 CRT appeared to be mainly a SVEC. Two NIX in 3 ph areas Ch 5-Λ_{34} Th; 5Λ_{70} Ra; 5Λ_{199} 0-2.0 Mev. Calc. from these data appear below:						
		for Th^{232} area Ch 5Λ_{34}				Bkgd = 114 CPM F_2 = 1.8595 $3F_2$ = 5.5785
18 fp gp	126	1.0	126	12 ±4.90	22.31 ±27.33	pCi Th / 18 fp. gp.
		for Ra^{226} area 5Λ_{70}				Bkgd = 158 F_2 = 1.502 $3F_2$ = 4.506
18 fp. gp	171	1.0	171	13 ±5.74	19.53 ±25.86	pCi Ra area / 18 fp gp.
		for 0-2.0 Mev area 5Λ_{199}				Bkgd = 199 F_2 = 1.2603 $3F_2$ = 3.7808
18 fp gp	214	1.0	214	15 ±6.43	18.90 ±24.31	pCi 0-2.0 Mev area / 18 fps.

Each value agrees fairly well, so activity present mainly due to Th^{232}

Count for 18 fps vs Th^{232} Std, Instrument TMC 4000 ch PHA Detector 3" NaI crystal

Voltage 1000 Gain 2.16 0-2.0 Mev in 1/2 in 200 chs Date Counted 9/11/69 Radiochemist RFB/LSC

Background see above CPM; Factor ______ pCi/cpm (net)

Robert F. Blair 10/6/69
SIGNATURE (UNIT REVIEW)

Dr. Edward Stein 10/6
SIGNATURE (SECTION REVIEW)

IH-375 (12-66)

104235

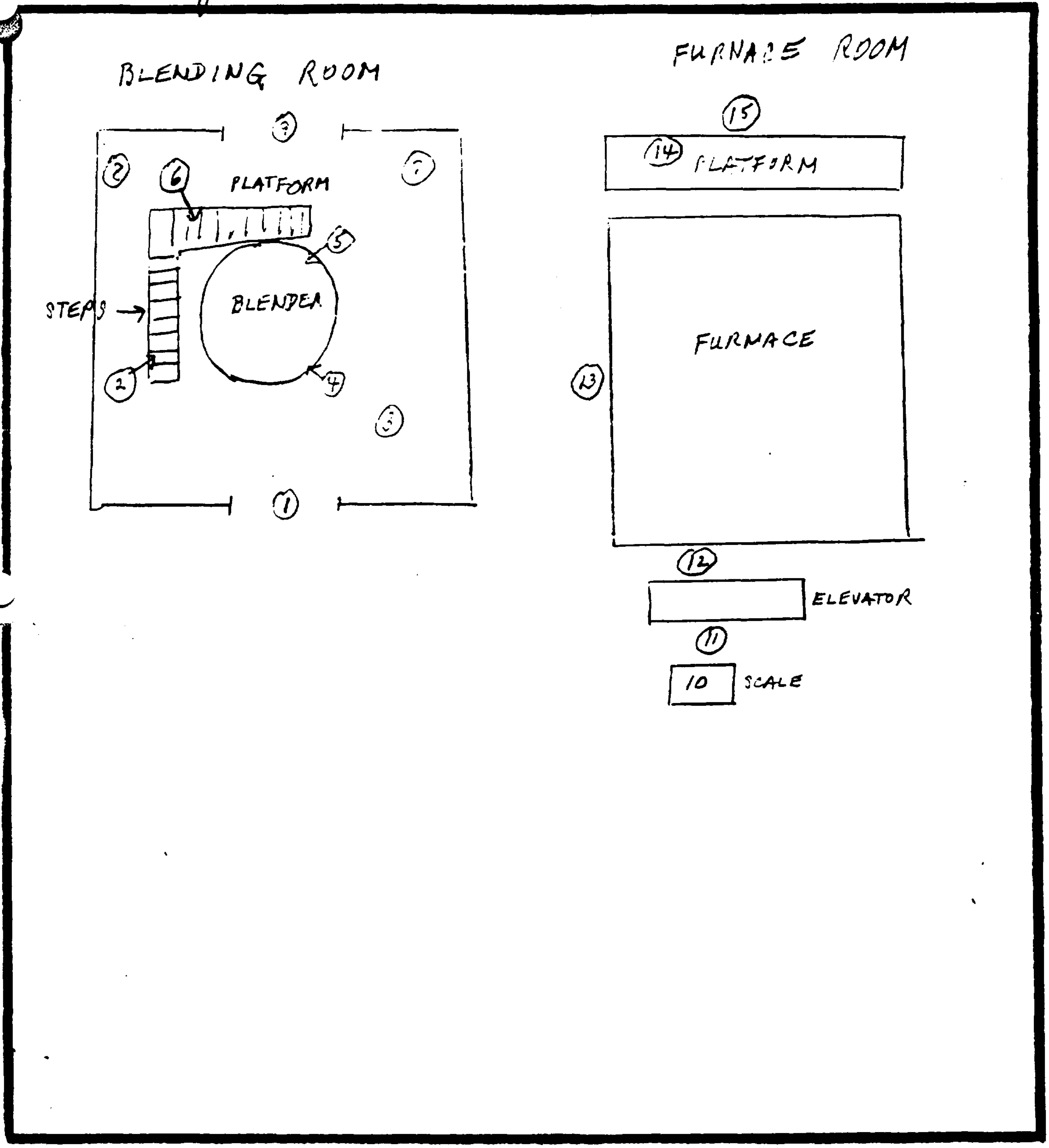
224 6 9

DIAGRAM OF SURVEYED AREA

Radiophysicist [illegible]

Installation # L 0456 Date 3/3/63

Firm Nah Chang S&R Address Glen Cove L.I.



H: Hard; S:Soft; a: Alpha; n: Neutron
Red Numerals: Radiation in MREM/HR
Green Numerals: Smear Numbers
Blue Circled Smear Numbers: Greater Than 3 x Background Standard Deviation or as Indicated

104236

IH-371 (12-64) ... 1M Sets

[illegible] CORPORATION
Glen Cove, N. Y.

RADIATION SURVEY REPORT

Date Mar 15 1959

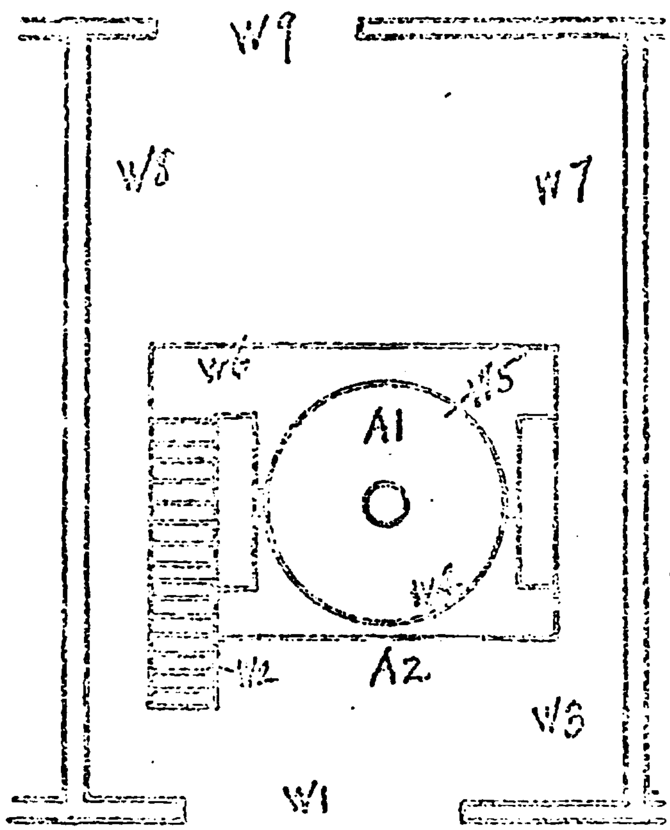
Air Sampling By B. [illegible]

Blending Room

Wipe Samples By ______

WIPE SAMPLES

W1 60 DPM
W2 25 DPM
W3 52 DPM
W4 46 DPM
W5 49 DPM
W6 49 DPM
W7 46 DPM
W8 25 DPM
W9 18 DPM
W10 ______ DPM



SAMSON METER READINGS

M1 ______ CPM
M2 ______ CPM
M3 ______ CPM
M4 ______ CPM
M5 ______ CPM
M6 ______ CPM
M7 ______ CPM
M8 ______ CPM
M9 ______ CPM
M10 ______ CPM

AIR SAMPLING STATIONS:

A1 (Loading) at 25 CFM, Sampling Time 15 Min., Shows 7 DPM/100 cm²

A2 (Unloading) at 15 CFM, Sampling Time 15 Min., Shows 7 DPM

Signed [signature]
Radiation Officer

104237

WAH CHANG CORPORATION

Glen Cove, N. Y.

RADIATION SURVEY REPORT

Date Mar 6 1959

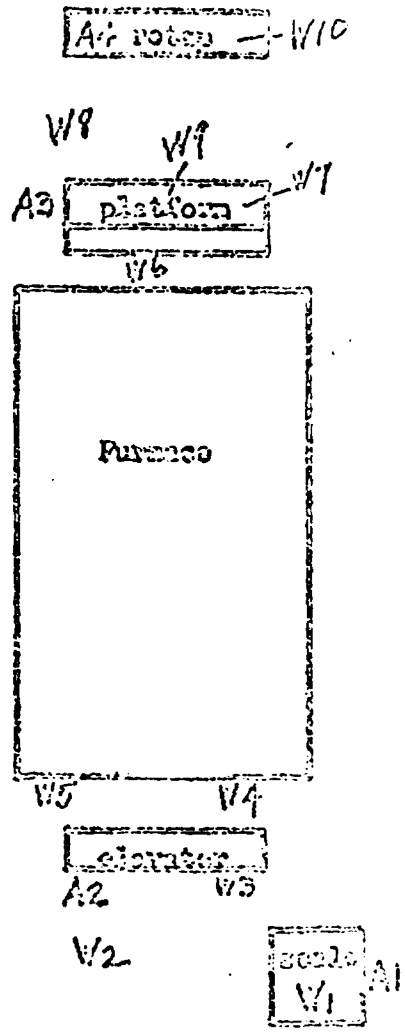
Air Sampling By [illegible]

Reduction Furnace No.

Meter Tests By

WIPE SAMPLES

W1	49 DPM/100 cm²
W2	28 DPM
W3	14 DPM
	11 DPM
W5	49 DPM
W6	47 DPM
W7	31 DPM
W8	46 DPM
	42 DPM
W10	25 DPM



SAMSON METER READINGS

M1	
M2	
M3	
M4	
M5	
M6	
M7	
M8	
M9	
M10	

AIR SAMPLING STATIONS:

A1 (Weighing) at 15 CFM, Sampling Time 15 Min., Shows 11 DPM/100 cm²

A2 (Elevator) " , " 15 Min., Shows 14 DPM

A3 (Unloading) " , " 15 Min., Shows 21 DPM

A4 (Rotor) " , " 15 Min., Shows 11 DPM

Signed [illegible]

Radiation Officer

104238

STATE OF NEW YORK — DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL HYGIENE
RADIOLOGICAL HEALTH UNIT
80 Centre Street
New York, N.Y. 10013

NOTICE OF INSPECTION FINDINGS

1. Date

2. Type Visit

3. Firm Name & Address

4. No. Employees Exposed
Male Female

5. Confines of Installation

6. Registration No

7. License No.(s)

8. Industrial Code

9. Radiation Safety Officer

10. Findings

☐ A. No item of non-compliance found.

☐ B. The following paragraphs of Code Rule 38, or conditions of your license were found in violation.

(47 ☐ 4)	(☐ 23)	(19 ☐ 34.1)
(☐ 5.1)	(47 ☐ 24)	(20 ☐ 34.2)
(☐ 6.2) 81	(47 ☐ 25)	(21 ☐ 34.3)
(☐ 9.1)	(15 ☐ 26.2)	(47 ☐ 34.4)
(☐ 9.1)	(15 ☐ 26.3) 81	(☐ 35.1)
(☐ 9.1)	(15 ☐ 26.4)	(47 ☐ 35.2)
(47 ☐ 10)	(30 ☐ 26.5)	(25 ☐ 36.1a)
(47 ☐ 11)	(47 ☐ 26.6)	(9 ☐ 36.1b)
(47 ☐ 20)	(47 ☐ 28)	(24 ☐ 36.1c)
(10 ☐ 21.1)	(16 ☐ 30)	(47 ☐ 36.2)
(11 ☐ 21.2)	(☐ 31.2)	(28 ☐ 37.2)
(13 ☐ 22.1)	(18 ☐ 32)	(31 ☐ 39)
(14 ☐ 22.2)	(18 ☐ 33)	(☐)
(☐)	(☐)	(☐)

11. Remarks

12. The violations indicated above should be removed within ________ days.

13. ______________________
Signature of Department Representative

IH-317.1 (8-65)

104239

14. DATE	15. REVIEWED BY	16. DISPOSITION
10-13-67	[illegible]	Compl. 1-68
2-28-68	[illegible]	" 4-68
5-10-68	[illegible]	" 6-68
7-11-68	[illegible]	" 8-68
9-13-68	[illegible]	" 10-68

REPORT ON COMPLIANCE VISIT

17. DATE	18. PERSON CONTACTED	19. REASON FOR NON-COMPLIANCE
3/6 68	[illegible]	[illegible] IC 26.4 - Firm looking into scaler, not compl. [illegible] in approval to purchasing [illegible] - Firm to be in compliance within 60 days.
4/-/68	H. Lee	26.4 - Firm has located a scaler and is in process of purchasing an α scint. detector. Should be in Compliance by end of May.
6/17/68	H. Lee	26.4 - α Scintillation probe & α source ordered on 5/20/68. Should be received by end of July.
8/23/68	H. Lee	26.4 - α Counter & α source received but equipment not functioning properly with old scaler - equipment was sent to B/A for repair. Should be functioning properly by end of Sept.
11/26/68	H. Lee	26.4 - Necessary equipment now functioning properly

20. DATE CASE CLOSED 11/25/68 21. INITIALS [illegible]

104240

New York St e Department of Labor

Ra ation Survey

Compl nce Information

(Note to Radiophysicist: Fill out in advance as much of the information as possible from company folder)

Date 9/2[illegible]/6[illegible]

Radiophysicist [illegible]

License/Registration No. [illegible]

A. Administrative Information

1. Name of installation or plant

Wah Chang Smelting & Refining Co

2. Address No. and Street 63 Hazelhurst Rd.

City Glen Cove

County Nassau

3. Person(s) interviewed:

	Name	Title
a.	H. Li	Chief Chemist
b.		
c.		

4. Type of industry

Metal Refining

b. Industrial Code Rule No. 38 — Rule No.

1. All radiation sources in plant have been registered/licensed:

yes ✓ no____ — 38-4, 38-5

2. Exempt quantities of radioactive material have not been combined or increased:

yes ____ no____ — 38-6.1

3. If an exempt device (U.S. AEC general license) has been received

a. the Industrial Commissioner has been notified:

yes ____ no____ — 38-6.2(a)

Rule No.

b. it has been disposed of in approved manner:

yes ____ no____ 38-6.2(b)

c. it has affixed to it an approved label:

yes ____ no____ 38-6.2(c)

d. the conditions of exemption (USAEC general license) have been complied with:

yes ____ no____ 38-6.2(d)

e. the device has been leak tested and on/off mechanism checked every six months (or as provided in U.S. AEC/other agreement state general license) (Kr-85 no leak test required, H-3 no leak or operation required)

yes ____ no____

i. the last test was ____________________

ii. results affixed to this report

yes ____ no____ 38-6.2(e)

f. testing and servicing of exempt (U.S. AEC generally licensed) device performed by duly licensed person or firm

yes ____ no____

License No. __________ 38-6.2(f)

g. any indication of possible leakage or damage to device has been investigated:

yes ____ no____

(Action taken)______________________________ 38-6.2(g)

4. Has there been any changes in proposed use, equipment, facilities, procedures, or personnel from those on registration/license:

yes ____ no X 38-8(a) & (b)

New personnel	Title
a. ________	________
b. ________	________
c. ________	________

104242

Rule No.

5. What licensed material has been received since last inspection

	Nuclide	Activity (μc, mc, c)
a.	Th [illegible]	[illegible]
b.		
c.		

38-9.1

6. What licensed material has been shipped off-site (other than as waste) (Use another sheet, if necessary.)

	Nuclide	Activity	Sent To	License/Registration
a.	Th.	[illegible]	[illegible]	welding rods [illegible]
b.				
c.				
d.				

38-9.2

7. Is special nuclear material (U-235, U-233, Pu-239) covered by this license: Yes ____ No ✓

Has special nuclear material been produced under this license:

Yes ____ No ✓

How much: ____________ 38-10

8. Is this license still valid: Yes ✓ No ____

Expiration Date on license until [illegible] 38-11

9. Has there been any violation(s) or failure(s) to observe the Industrial Code Rule 38 or any other applicable rule, regulation, code or order to your knowledge? Yes ____ No ____

Enumerate a. ____________

b. ____________ 38-14

10. Has a license or permit been issued by N.Y.S. or N.Y.C. Dept. of Health to you? Yes ____ No ✓

Have you transported and used radioactive material or radiation producing devices in another state: Yes ____ No ✓

State ____________ 38-18

104243

Rule No.

11. Is a U.S. Atomic Energy Commission License held?

Yes ____ No ✓ U.S. AEC Lic. No. ____________ 38-19

C. Radiation Protection Program

1. Personnel dosimetry

a. External Exposure (Whole Body)

No. of Persons Working with Ionizing Radiation	No. of Persons Wearing Film Badges (WB)	Number in Given Dose 0 or N.D. rem/y	0-3 rem/y	3-5 rem/y	>5 rem/y
NA					

b. External Exposure (Extremities)

No. of Persons Working with Ionizing Radiation	No. of Persons Wearing Wrist or Finger Badges	Number in Given Dose 0 or N.D. rem/y	0-25 rem/y	25-75 rem/y
NA				

c. No. of Exposed Persons Under 18 years of Age NA.

d. Are Cumulative Lifetime Dose Records maintained for exposed personnel:

Yes ____ No NA 38-21.1

2. Is radiation dose, acquired by personnel at other place of employment, maintained in this facility? Yes ____ No NA. 38-21.1

3. Is the airborne activity in controlled areas monitored?

Yes X No ____ 38-21.2

4. If yes:

Nuclide (s)	Location	Concentration (μc/cm³)
a. note – no	sample	collected with
b. a [illegible]	meter	and [illegible],
c. [illegible] in	~~not~~ open.	
d.		
e.		

38-21.2

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5. Is there any potential exposure of persons in uncontrolled area?

Yes ✓ No____

If yes: a. External Exposure (copy of survey is adequate)

Nuclide(s)/Machine	Location	Dose Rate
a.		
b.		
c.		
d.		
e.		

38-22.1

b. Internal Exposure not monitored

Nuclide(s)	Location	Concentration($\mu c/cm^3$)
a.		
b.		
c.		
d.		
e.		

38-22.2

6. Disposal of Radioactive waste

Solid

Date	Vendor	Activity
a.		
b.	None	
c.		
d.		

Liquid

Date	Vendor or Sink Disposal	Activity
a.		
b.	None	
c.		
d.		

Gas

D	Vendor or Atmospheric Disposal	Activity
a.		
b.	None	
c.		
d.		

38-23

7. Has there been any human use of radioactivity under this license?

Yes ______ No X

38-24

8. Name of Radiation Safety Officer is [illegible]

His experience with ionizing radiation is (if not on application)

______

______ 38-25

9. Survey Instruments (If not on application)

Mfg. Name	Model & Serial No.	How often Calibrated	Last Calibrated
a. Samson			1964
b. Nucl Chicago - GM			1964
c.			
d.			

38-26.1

10. Surveys:

Radiation Equipment: How often N/A Last ______ 38-26.2

Radioactive Materials (sealed):
(How often N/A Last ______ 38-26.3 & 38-26.5

Leak test of Sealed Sources: Date: N/A

Result ______ µc

Performed by: ______

Rule No.

11. Radioactive Materials (unsealed) Survey: How often ____ Last 5/1/6 38-26.4

12. Are interlocks and timers in good shape?

Yes N/A No ____

Last checked ____________

By ____________ 38-26.6

13. Are instructions given to personnel re:

eating, drinking and smoking in controlled areas

Yes ____ No N/A.

Instructions Posted Yes ____ No ____ 38-28

14. Has any controlled area been vacated or converted to other use?

Yes ____ No X 38-29

If yes, attach copy of final survey

15. Are all controlled areas marked with the proper radiation hazard symbol and clearly visible?

Yes ____ No ____

Location(s) marked with "Radiation Area" Signs ____________

(5-100 mrem/hr)

Location(s) marked with "High Radiation Area" Signs ____________

(>100 mrem/hr)

Location(s) marked with "Airborne Radioactivity Area" ____________

Location(s) marked with "Radioactive Material(s) Sign ____

(normally in Radiation Areas) 38-31

Rule No.

16. Labels on container(s): Are all container(s) properly marked which contain (a) radioactive material in quantities greater than that listed in Table (4) other than U or Th and (b) U or Th in quantities 10 times greater than that listed in Table (4). Yes X NO ____

Are radioisotope storage containers marked with label which states activity and nuclide with date? Yes ____ No X 38-32

17. Are all radiation producing machines other than Medical and Dental X-Ray Units marked with hazard symbol and appropriate cautionary wording? Yes ____ No N/A. 38-33

18. Have all persons who work in control areas been instructed in (a) presence of radiation, (b) procedures to minimize exposure to radiation, (c) applicable provisions of Code Rule 38, and (d) personnel dosimetry including bioassay the need for, and his rights to foregoing information: Yes X No ____ 38-34.1

19. Do you keep available for employees: Copies of Code Rule 38, license(s) or registration(s) covering radiation, and operation procedures? Yes X No ____ 38-34.2

20. Is the "Notice to Employees" posted so that employees can read it on their way to or from controlled areas? Yes Y No ____ 38-34.3

21. How and where are radiation sources stored when not in use?

Location [illegible]

Is there any flammable, toxic materials stored in same location: Yes ____ No X

If yes, give description ________________ 38-35.1

In your opinion will this storage area provide reasonable protection against

Rule No.

loss, leakage or dispersion by fire effects, water, hose streams or other means used to fight fire.

yes _____ no _____

If no; what is being done to improve storage? ______________ 38-35.2

22. Records:

a. Survey, check, and test records. yes X no _____

b. Transfer, receipt, and disposal of radioactive materials records. yes _____ no X   No records permanently installed

c. Personnel Dosimetry records. yes _____ no X

d. Bio-assay and medical evaluation service records.

yes _____ no X 38-36.1

23. Dose, bio-assay and medical evaluation service records are on approved forms. yes _____ no N/A

These records are preserved for how long: N/A year(s)

All other records are preserved for [illegible] year(s) 38-36.2

24. Has there been:

a. Any theft or loss of any radiation source?

yes _____ no X

Date of last inventory check ______________

b. Any incident involving such radiation source which may have caused or threatens to cause any individual to receive a dose that exceeds the limit permitted by this Rule.

yes _____ no X

If yes, give details:

____

____

____

____

104249

Rule No.

c. Any level of radiation from, or release of, a concentration of radioactive material in any uncontrolled area that exceeds 10 times the limit permitted by this Rule or any applicable license:

yes _____ no __✓__

If yes, give details:

____

____

____

d. Was this reported to the Commissioner? yes _____ no _____

If yes:

Date _____________________ By _____________________ 38-37

25. Has any employee(s) (present or past) requested information on the dose he has received? yes _____ no __✓__

Note: Attach a copy of form on which this information is reported. 38-37.2

26. A meter and/or smear radiation survey was made at __________ by _________________________ and results are attached.

End of Report

Date 9/25/6

Time __________

By [signature]

Note: Any person (firm) may petition the Board of Standards and Appeals: "If there shall be practical difficulties or unnecessary hardship in carrying out provisions of . . . . this rule . . . ".

1238 Std

5100-6000 c/m =

10,000 to 12,000 d/m

WAH CHANG CORPORATION

Glen Cove, N. Y.

RADIATION SURVEY REPORT

Date Sept 14 1966

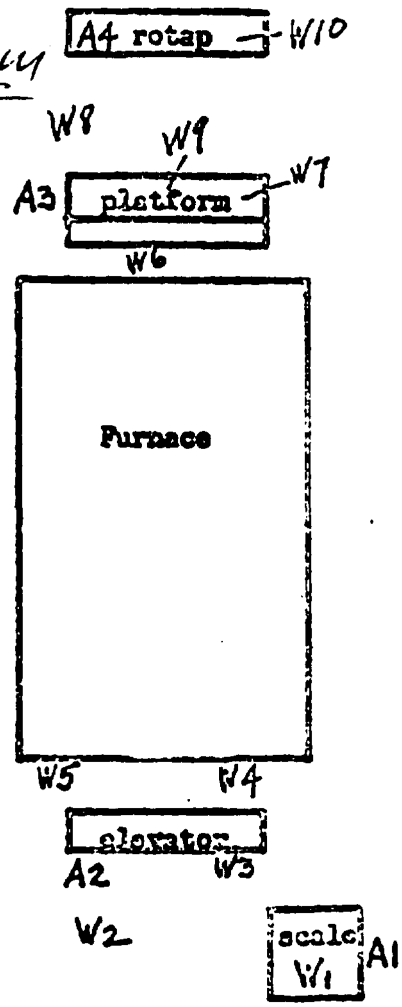
Air Sampling By ______________

Reduction Furnace No. 8

Meter Tests By F. H. Lee

CPM X 2 = dpm

WIPE SAMPLES		
W1	None	CPM
W2	1X20	CPM
W3	1X20	CPM
W4	1X20	CPM
W5	1X10	CPM
W6	1X20	CPM
W7	1X30	CPM
W8	1X50	CPM
	1X40	CPM
W10	1X40	CPM



SAMSON METER READINGS	
M1	1X325
M2	1X125
M3	5X200
M4	1X150
M5	1X25
M6	1X50
M7	1X50
M8	1X10
M9	1X50
M10	1X50

AIR SAMPLING STATIONS:

A1 (Weighing) at 15 CFM, Sampling Time _____ Min., Shows ________ CPM

A2 (Elevator) " , " _____ Min., Shows ________ CPM

A3 (Unloading) " , " _____ Min., Shows ________ CPM

A4 (Rotap) " , " _____ Min., Shows ________ CPM

Note: No air sampling was taken since there was no production of thoriated tungsten powder.

Signed [signature]

Radiation Officer

104251

RADIOLOGICAL HEALTH UNIT
80 Centre Street
New York, N. Y. 10013

NOTICE OF INSPECTION FINDINGS

1. 2/ /26
2. Type of Visit: 2

3. Firm Name & Address: Utah Canning Smelting & Refining Co. 63 Hubbhill Rd. Charles[illegible]

4. No. Employees Exposed — Male: 10 — Female: 0

5. Confines of Installation: [illegible]

6. Registration No.:

7. License No.(s): 743-0464

8. Industrial Code: 33

9. Radiation Safety Officer: H. Lee

10. Findings

☐ A. No item of non-compliance found.

☒ B. The following paragraphs of Code Rule 38, or conditions of your license were found in violation.

(47 ☐ 4)		(☐ 23)		(19 ☐ 34.1)	
(☐ 5.1)		(47 ☐ 24)		(20 ☐ 34.2)	
(☐ 6.2)		(47 ☐ 25)		(21 ☐ 34.3)	
(☐ 9.1)		(15 ☐ 26.2)		(47 ☐ 34.4)	
(☐ 9.1)		(15 ☐ 26.3)		(☐ 35.1)	
(☐ 9.1)		(15 ☒ 26.4)	Unsealed Source surveys	(47 ☐ 35.2)	
(47 ☐ 10)		(30 ☐ 26.5)		(25 ☒ 36.1a)	Records of Survey
(☐ 11)		(47 ☐ 26.6)		(9 ☐ 36.1b)	
(47 ☐ 20)		(47 ☐ 28)		(24 ☐ 36.1c)	
(10 ☐ 21.1)		(16 ☐ 30)		(47 ☐ 36.2)	
(11 ☐ 21.2)		(☐ 31.2)		(28 ☐ 37.2)	
(13 ☐ 22.1)		(18 ☒ 32)	~~Rad. Hazard~~ [illegible] Sign (Complied)	(31 ☐ 39)	
(14 ☐ 22.2)		(18 ☐ 33)		(☐)	
(☐)		(☐)		(☐)	

11. Remarks

104252

12. The violations indicated above should be removed within 30 days.

13. [signature] — Signature of Department Representative

IH-317.1 (8-65)

14 DATE	15 REVIEWED BY	16 ACTION
7-27-66	GT	Compl. Sept. 66
10-13-66	GT	Reg.

REPORT ON COMPLIANCE VISIT

17 DATE	18 PERSON CONTACTED	19 REASON FOR NON-COMPLIANCE
9/23/66	H. Lee	Complied - sent copy of special survey
9/29/66	H. Lee	Made visit to clear up question as to survey report (Re. meter calibration.)

9/29/66 [illegible]

104253

D.C. No.: E 0206

HART

Name: KARL BOLDT

Affiliation: F. C. HART ASSOC.

~~Phone:~~ Address: 530 FIFTH AVE., NEW YORK, NY 10036

~~Address:~~ Phone: (212) 840-3990

Client/Job No: 00265-02-00035-01

Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
TEM 1		6/26/89		FILTER	1	ASBESTOS (TEM)
TEM 2		↓		↓	↓	↓
TEM 3						
TEM 4		6/27/89				
TEM 5		↓				↓
ICP 1		6/26/89				METALS (ICP) NIOSH 7300
ICP 2		↓				↓
ICP 3						
ICP 4		6/27/89				
ICP 5		↓		↓	↓	↓

Comments: DETECTION LIMIT OF 1 MG ~~[illegible]~~ NECESSARY FOR ICP METALS, PER NIOSH METHOD 7300.

Relinquished by: Karl Boldt Date: 6/28/89 Shipment Method: FED EXP
Time: 5 PM Airbill No.: 9643704081

Received by: ______ Date: ______ Relinquished by: ______ Date: ______
Time: ______ Time: ______

Received by: ______ Date: ______ Relinquished by: ______ Date: ______
Time: ______ Time: ______

Final Disposition of Samples: ______

Received by: ______ Date: ______ Time: ______

HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

J.C. NO.: 2 0201

HART

Name: KARL BOLDT

Affiliation: F. C. HART ASSOC.

Phone: (212) 840-3990

Address: 530 FIFTH AVE, NEW YORK, NY 10036

Client/Job No: 00265-02-00035-01

Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
ICP B		6/27/89		FILTER	1	METALS (ICP) NIOSH 7300

Comments: DETECTION LIMIT OF 1 Mg NECESSARY FOR ICP METALS, PER NIOSH METHOD 7300

Relinquished by: Karl Boldt Date: 6/28/89 Shipment Method: FED EXP
Time: 5 PM Airbill No.: 9643704081

Received by: ______ Date: ______ Relinquished by: ______ Date: ______
Time: ______ Time: ______

Received by: ______ Date: ______ Relinquished by: ______ Date: ______
Time: ______ Time: ______

Final Disposition of Samples: ______

Received by: ______ Date: ______ Time: ______

HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

APPENDIX E

ECOTEST LABORATORIES, INC. *ENVIRONMENTAL TESTIN*

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO. C880826/10 04/15/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D: 04/08/88 RECEIVED: 04/08/88

SAMPLE: Water sample, GM-7

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<1
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<2
Trichlorofluomethane	ug/L	<2
11 Dichloroethene	ug/L	<2
11 Dichloroethane	ug/L	<2
12 Dichloroethene	ug/L	<2
Chloroform	ug/L	<1
12 Dichloroethane	ug/L	<2
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
12 Dichloropropane	ug/L	<2
t 13 Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	<1
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c 13 Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	<2

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
13 Dichlorobenzene	ug/L	<2
12 Dichlorobenzene	ug/L	<2
14 Dichlorobenzene	ug/L	<2
Benzene	ug/L	<1
Toluene	ug/L	<2
Ethyl Benzene	ug/L	<1
m Xylene	ug/L	<2
o+p Xylene	ug/L	<4
Calcium as Ca	mg/L	26
Cobalt as Co	mg/L	<0.0
Nickel as Ni	mg/L	<0.1
Sodium as Na	mg/L	28
Mercury as Hg	mg/L	<0.0
Lead as Pb	mg/L	<0.0
Chromium as Cr	mg/L	<0.0
Cadmium as Cd	mg/L	<0.0
Arsenic as As	mg/L	<0.0
Tantalum	mg/L*	0.07
Tungsten	mg/L*	<0.1
Chloride as Cl	mg/L	14
Nitrate as N	mg/L	<0.5
Sulfate as SO4	mg/L	68

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.

DIRECTOR ____________________

104257

ECOTEST LABORATORIES, INC. ENVIRONMENTAL TESTIN

377 SHEFFIELD AVE. • N. BABYLON, N.Y. 11703 • (516) 422-5777

LAB NO.C880826/9 04/15/88

Geraghty & Miller, Inc.
125 East Bethpage Rd.
Plainview, NY 11803
ATTN: Vince Glasser

SOURCE OF SAMPLE: Glen Cove, NY1342LI01
COLLECTED BY: Client DATE COL'D:04/08/88 RECEIVED:04/08/88

SAMPLE: Water sample, GM-8

ANALYTICAL PARAMETERS		
Chloromethane	ug/L	<1
Bromomethane	ug/L	<1
Dichlordifluomethane	ug/L	<1
Vinyl Chloride	ug/L	<1
Chloroethane	ug/L	<1
Methylene Chloride	ug/L	<2
Trichlorofluomethane	ug/L	<2
11 Dichloroethene	ug/L	<2
11 Dichloroethane	ug/L	<2
12 Dichloroethene	ug/L	7
Chloroform	ug/L	<1
12 Dichloroethane	ug/L	<2
111 Trichloroethane	ug/L	<1
Carbon Tetrachloride	ug/L	<1
Bromodichloromethane	ug/L	<1
12 Dichloropropane	ug/L	<2
t 13 Dichloropropene	ug/L	<2
Trichloroethylene	ug/L	5
Chlorodibromomethane	ug/L	<1
112 Trichloroethane	ug/L	<2
c 13 Dichloropropene	ug/L	<2
2chloroethvinylether	ug/L	<2
Bromoform	ug/L	<2
1122Tetrachloroethan	ug/L	<2
Tetrachloroethene	ug/L	66

ANALYTICAL PARAMETERS		
Chlorobenzene	ug/L	<1
13 Dichlorobenzene	ug/L	<2
12 Dichlorobenzene	ug/L	<2
14 Dichlorobenzene	ug/L	<2
Benzene	ug/L	<1
Toluene	ug/L	<2
Ethyl Benzene	ug/L	<1
m Xylene	ug/L	<2
o+p Xylene	ug/L	<4
Calcium as Ca	mg/L	36
Cobalt as Co	mg/L	0.005
Nickel as Ni	mg/L	<0.1
Sodium as Na	mg/L	18
Mercury as Hg	mg/L	<0.0
Lead as Pb	mg/L	<0.0
Chromium as Cr	mg/L	<0.0
Cadmium as Cd	mg/L	0.01
Arsenic as As	mg/L	<0.0
Tantalum	mg/L*	0.27
Tungsten	mg/L*	<0.1
Chloride as Cl	mg/L	26
Nitrate as N	mg/L	0.6
Sulfate as SO4	mg/L	230

cc:

REMARKS: *Analyzed for EcoTest by PTL Testing Laboratories, Trenton N.J.; report enclosed.

DIRECTOR

rn= 3087

104258

LI TUNGSTEN SITE INVESTIGATION REPORT (Volume 2)

Prepared For:

Campon Realty Corp.

445 Fifth Avenue

New York, NY 10016

Prepared by:

RTP Environmental Associates, Inc.

400 Post Avenue

Westbury, NY 11590

May, 1988

DRAFT

TANK CLEANING PROPOSAL

PROPOSAL

AMERICAN ENVIRONMENT TECHNOLOGIES CORP

38-40 Oak Street
Norwood, New Jersey 07648
Telephone 201-767-6757 NJ
1-800-433-5937

PROPOSAL NO. 926

PROPOSAL SUBMITTED TO: R.T.P. Environmental Associates, Inc.	PHONE: 516-333-4526	DATE: 5/4/88
STREET: 400 Post Avenue	ATTENTION: Mr. Kenneth Skipka	
CITY, STATE & ZIP CODE: Westbury, New York 11590	JOB SITE: LI Tungsten Site, Glen Cove, N.Y.	

SPECIFICATIONS:

WE HEREBY SUBMIT SPECIFICATIONS AND ESTIMATES FOR THE FOLLOWING:

The costs involved in supplying the manpower, equipment and materials necessary are as follows:

1. Tank will be entered, squeegee cleaned, and triple rinsed after pumping and removal of contents would be $ 203,000.00.

NOTE: R.T.P. is responsible for the disposal of liquid or to designate an environmentally sound, on site tank for the transfer of liquid for later disposal by R.T.P.

NOTE. R.T.P. is responsible for providing roll-off containers for any solids removed for tank and for properly disposing of same.

NOTE: R.T.P. is responsible for supplying vac truck to assist in the tank cleaning.

NOTE: The above price is based on using heavy equipment that will be on site for the demolition and is covered in the demolition proposal.

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THIS PROPOSAL IS MADE THIS 4th DAY OF May, 19 88

AUTHORIZED REPRESENTATIVE: Tony Daito
Tony Dalto

CONDITIONS: ALL MATERIAL AND WORKMANSHIP IS GUARANTEED TO MEET SPECIFICATIONS. ALL WORK TO BE COMPLETED IN A PROFESSIONAL WORKMANSHIP MANNER ACCORDING TO STANDARD PRACTICES. ALL WORK TO BE PERFORMED IN COMPLIANCE WITH OSHA REGULATIONS AND LOCAL, STATE AND FEDERAL RULES & REGULATIONS. ANY ALTERATIONS TO AND/OR DEVIATION FROM THE ABOVE OR ATTACHED SPECIFICATIONS, INVOLVING EXTRA COSTS, WILL BE EXECUTED ONLY UPON WRITTEN ORDERS AND WILL BE BILLED AS AN EXTRA CHARGE OVER AND ABOVE THIS ESTIMATE.

TERMS: 50% UPON SIGNING OF THIS CONTRACT
BALANCE-NET UPON COMPLETION OF WORK
INTEREST-1½% PER MONTH ON ANY UNPAID BALANCE.

After 30 days-1½% interest.
After 60 days-all legal fees for collection will be your responsibility.

ACCEPTANCE OF PROPOSAL: THE ABOVE PRICES, SPECIFICATIONS AND CONDITIONS ARE SATISFACTORY AND ARE HEREBY ACCEPTED. PAYMENT WILL BE MADE AS OUTLINED ABOVE. YOU ARE AUTHORIZED TO PROCEED WITH THE WORK AS SPECIFIED.

DATE ____________ ORDER NO. ____________ SIGNATURE ____________

NOTE: THIS PROPOSAL MAY BE WITHDRAWN BY US IF NOT ACCEPTED WITHIN 30 DAYS

AMERICAN ENVIRONMENT TECHNOLOGIES CORP.
38-40 OAK STREET
NORWOOD, NEW JERSEY 07648
NJ (201) 767-6757 USA 1-800-433-5937
FAX (201) 767-1889

April 7, 1988

RTP Environmental Associates Inc.
400 Post Avenue
Westbury, New York 11500

Attention: Mr. Ken Skipka

Reference: Li Tungsten Site
Glen Cove, New York

Dear Mr. Skipka:

Enclosed please find our inventory of known tanks at the Li Tungsten facility. All tanks with reasonable access were measured for quantity but there were some tanks that were sealed and our count is based on previous information provided by RTP.

Please note that before work commenced entire area, then specific tanks were tested for oxygen, toxicity and flammability with the Neotronics Exotox Portable Multi-Gas Monitor. Readings fell within safe guidelines except for obvious ammonia and acid tanks. As part of our normal operational procedures and especially because of large amount of asbestos, all our personnel wore full face respirator masks equipped with appropriate filter cartridges, full protective suits, boots, gloves and hard hats.

Due to the general run down condition of this abandoned facility, we recommend immediate measures be taken in order to protect against serious environmental problems:

1. Asbestos abatement should commence immediately. There are several areas of free falling asbestos.
2. Many of the storage tanks and associated piping are corroded, or linings collapsed and are not safe. All flowable liquids should be disposed of as soon as possible. If final disposal poses a logistics problem at this time, please consider the following. The most sound tank of each individual product may be used as a holding tank if a protective berm is constructed around perimeter of the tank. Then liquid from unsafe tank could be

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pumped into holding tank, sludge and solids can be removed into approved containers, tank can then be cleaned and demolished.

3. The underground storage tanks should be cleaned, excavated and disposed of soon. Leaks are much more likely and environmental liability must be assessed.
4. Structural damage due to neglect and corrosion througnout the buildings and especially ladders, catwalks etc. is extensive. If other work is going on at the site, probability of disturbance and damage to these structures could result. We recommend demolition work begin in conjunction with above mentioned phases in order that work can be completed in the safest, most expedient manner.

Thank you for using American Environment Technologies Corp. If you have any questions or would like to schedule beginning of your project, please give me a call.

Sincerely,

Peter Melber

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AMERICAN ENVIRONMENT TECHNOLOGIES CORP.
38-40 Oak Street
Norwood, New Jersey 07648
Telephone 201-767-6757 NJ
1-800-433-5837 USA

SUMMARY OF TANK INVENTORY

LOUNG BUILDING (OUTSIDE)

Tank I.D. No.	Capacity	Current Condition	Description
L-9E Steel Tank	5,800	1'	NH4WO4 solution
L-8A NH3 Scrubber Tank	12,000	Empty	
L-8 "	12,000	1'	
L-6 Steel Tank	12,000	1/2 full	APT Mother Liquor
L-5 "	12,000	3/4 full	"
L-9 "	"	Empty	"
L-10 "	"	Empty	"
L-13A "	12,000	1/2 full	ACR Leaching Sol.
L-13B "		1/2 full	"
L-550 "	2,000	full	water
L-550A "		3/4 full	
L-611 "	2,000	1000	solid
L-568 "	"	full	
*L-101 "			ammonia?
*L-102 "		empty	
*L-103 "		empty	
*L-104 "		empty	
*L-105 "		empty	
*L-106 "		empty	
*L-107 "		empty	
*old 9C "		empty	
*old 9D "		empty	
#85 unknown			
#86 unknown			

LOUNG BUILDING (INSIDE)

Tank I.D. No.	Capacity	Current Condition	Description
L-9A APT Crystallizer	2,400		
L-9B "	"		
L-9C "	"		
L9-D "	"	Empty	
L-9R-1 Steel Tank	1,000	Empty	
L-9R-2	5,000		
L-9F	2,800	Empty	
L-11	12,000		

* ( ) designates unable to open

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EAST BUILDING (OUTSIDE)

Tank I.D. No.	Capacity	Current Condition	Description
233 Wooden Tank	20,000	18,000	Spent HCl Acid
231 "	20,000	15,000	"
232 "	"	15,000	
235 Steel Tank	8,000	2,000	Aqua NH3
1213-1 Fiberglass Tank	17,000	(Empty) Gauge shows 1-1/2'	HCl Acid Stor. Tank
1213-2 "	"	"	"
1213-3 "	"	(Empty) Broken	"
1330 Lime Silo	64 ton	Gauge Indicates 10%	"
237 Steel Tank	8,500	full	lime & water mixer
1329 "	13,000	empty	
1328 Thickener	19,000	1/2 full dirt	solution & precipi- tate from neutraliz
1332 Vertical Steel Tank	8,000	full	water
1333 "	7,000	(5,500)	water & scheelite
1334 "	3,500	(250)	spent HCl acid
1335 "	24,000	(Empty)	"
1345 "	12,000	(Empty)	"
E-3 Steel Tank		(Empty)	
245	16,000	12,000	FM residue
246 "	"	15,000	ACR Leaching sol.
1302 Aqua NH3	9,000	(1,700)	Aqua NH3
1303 Enrichment Tank		1'	
1306 Absorber Tank	1,000	3'	NH3 Solution
1307 "	"	3 1/2'	"
1308 "	"	4'	"
1336 Vertical tank	9,000	4,500	ACR Residue
244 Steel tank	16,000	8,000	water
248 "	5,500	2,500	P.D. Residue
249 "	23,000	full	P.D. Leaching sol.
242 Concial Tank	5,500	(100)	NaOH solution
*79 Fiberglass Tank		3'	
*80 "		6"	
#84 VAT		1'	
#9 Steel Tank		(Unknown)	

*( ) designates unable to open

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EAST BULDING (INSIDE)

Tank I.D. #	Capacity	Current Condition	Description
262 Steel Tank	17,000	70 g.	Stathetic Sheelite
263 "	"	"	"
264 "	"	"	"
265 "	"	"	"
266 "	"		"
268 Haveg Tank	"	36"	
269 "	"	7"	
270 "	"	39"	
271 "	"	40"	
274 "	"	Empty	
275 "	"	28"	
276 "	"	Empty	
277 "	"	"	
278 "	"	"	
279 "	"	"	
280 "	"	"	
281 "	"	"	
282 "	"	"	
1341 "		"	
1342 "		"	
1343 "		47"	
1344 "		51"	
285 R & B Lined Tank	6,000	Empty	
286 Steel Tank	16,000	3"	Tungsten Acid
287 "	16,000	2"	
616 Glass lined tank	4,000	10,000	P.D. Sol. & Residue
617 Rubber lined tank	6,000	2'	
618 Surge tank	1,100	Empty	
619 Rubber lined tank	5,000	(Empty)	
620 Residue Digester	4,000	(Empty)	
1337 Vertical Steel Tnk	1,700	2"	
1338 Rubber lined	3,000	40"	
1339 "	"	8"	
1340 "	"	8" solid	
255 Steel Tank 6'x3'		2,200	
*1 Underground 5' x 8'		(unknown)	
*2 By tank 555		full	
*3 9 x 5		(unknown)	
*4 underground pit 5' deep		(unknown)	
*5 sealed		full	
*6		(unknown)	
*78 sealed		empty	
		(unknown)	

* ( ) designates unable to open

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PRESSURE DIGESTER SYSTEM

Tank I.D. No.	Capacity	Current Condition	Description
#60 Jacketed Digester		Empty	
#64 "		Empty	
56 Dilution tank	4,000	2,000	P.D. Sol & Residue
58 "	4,000	1,000	"
P-1 Mixer		1/2 full	
83		full	
82		empty	
89		empty	
88		empty	
41 underground gasoline tank		contents unknown	
89A unknown			

DICE BUILDING (OUTSIDE)

Tank I.D. No.	Capacity	Current Condition	Description
22		empty	
23		empty	
24 550g. oil tank	6"		
25 10,000g. oil tank	7"		
26 10,000g. oil tank	7"		
27		empty	
31		empty	
19		empty	
20 outside boiler room	3"		
21 "		unknown	
A underground storage tank	10,000 g.	4"	
B "	1,000 g.	unknown	
30		empty	
32		full	
33		1/2 full	
34		empty	
35 NaOH Storage Tank	95,000	3,000	50% NaOH
36 CaC12 Storage Tank	95,000	2,000	30% CaC12
37		empty	
38		empty	
39		empty	
40		empty	
Ball Tank	13,000	(Empty)	
Propane Tank	8,000	(Empty)	
Fuel Oil Tank	500,000	(Empty)	
Water Reservoir	150,000	1/4 full	

* ( ) designates unable to open

DICE BUILDING (OUTSIDE) Con't

Tank I.D. No.	Capacity	Current Condition	Description
Oil Change Pit		Full of Liquid	
45-55 Warehouse Area		empty	
C 10,000 g. underground storage tank			
D 550 storage tank 1-1/2'			
41-44		empty	
2 acid trucks			
56-59			
59A			
underground gasoline tank - contents unknown			

DICE BUILDING INSIDE
A - Mixer Room Section

Tank I.D. No.	Capacity	Current Condition	Description
M-1-A Steel Tank	200	Empty	
M-1 Steel Tank Sol	2,000	500	Residue & Leach.
M-2 "	2,900	1,100	
M-3 "	1,500	Empty	
M-4 "	3,000	1,800	Cobalt Chloride So.
M-5 "	3,000	1,800	
M-6 "	1,700	Empty	
M-7 "	"	Empty	
M-8 "	"	(Empty)	
M-9 "	"	Empty	
M-10 "	1,400	"	
M-11 "	"	700	Sodium Tungstate Solution & Residue

(B) K-Tanks Section

Tank I.D. No.	Capacity	Current Condition	Description
K-1 Steel Tank	12,000	7,000	Sodium Tungstate So
K-2 "	"	11,000	"
K-3 "	"	11,000	"
K-4 "	"	7,000	"
K-5 "	"	500 sludge	NF Residue
K-6 "	"	2,000	Sodium Tungstage So
K-7 "	"	6,000 solid	NF Residue
K-8 "	"	2'	
K-9 "	"	7,000 g.	
W-1 Underground Tank	"	full - sludge	
W-2 Steel Tank	"	600 g.	
W-3 "	"	full	

* ( ) designates unable to open

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DICE BUILDING INSIDE
(B) K-Tanks Section

Tank I.D. No.	Capacity	Current Condition	Description
W-4 Steel Tank		full	

(C) Cobalt Process Section

Tank I.D. No.	Capacity	Current Condition	Description
833 Brick lined	4,500	Empty	
832 Thickener	20,000	2,000	
840 Acid Tank	11,000	(Empty)	
C-1	3,000	Empty	
C-2	"	"	
C-3	1,200	full	Cobalt Sulfate Sol. & FM Residue
C-4	5,500	full	Cobalt Sulfate Sol
C-5	"	full	"
C-6	3,000	700	"
C-7	"	2,500	"
C-8	6,000	Empty	"
C-9	"	Empty	"
C-10	3,000	full	
C-11	"	full	"
C-12	"	full	"
C-13	"	1,500	"
C-14	"	full	
C-15	"	Empty	
*16	Blg.	50% full	
*17	sealed	(unknown)	
*18		full	
*19	sealed	(unknown)	
*667	"	"	

Boiler Room

#120 oil tank -small
#121 oil tank - small
Far west end of Dice Bldg.
#28 Ball tank - empty
#29 " empty

* ( ) designates unable to open

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significant amount of chemical analysis took place in support of the facility's operations. Finally, scattered both throughout this parcel and in the Warehouse area are numerous stacked drums and crates of processed ores which were set aside in similar lots in the event that reprocessing would prove to be economically feasible.

The parcel north of Herb Hill Road and east of Dickson Lane was not used for processing activities. The southern portion of the parcel (south of the small natural pond) was used for parking by the site employees. A small portion of the area north of the pond was apparently used as a landfill and waste pile storage area for wastes generated from the main processing operations.

The parcel west of Dickson Lane has several distinctive features. The Reduction Building was utilized for high temperature processing of tungsten into tungsten carbide powder. Its furnaces were fed hydrogen enriched air, with hydrogen supplied by a bank of batteries in the eastern portion of the building. The large ball tank on the western side of the building was constructed to store hydrogen for the tungsten carbide production process, but was never utilized. Permits for its operation were never approved. The New Warehouse is the largest structure on this northwest parcel and was used for materials storage. Unlike the warehouse on the southeast parcel, there is very little storage of processed ores in this building. The 500,000 gallon fuel tank south of the New Warehouse was not used by the Li Tungsten facility. A nearby fuel oil facility utilized the tank for storage purposes. Finally, the Mud Pond on the southern portion of this parcel is a lined surface impoundment and settling basin. Processed wastewater from operations on the nearby southeast parcel were pumped into the Pond where natural settling of suspended solids and evaporation of water would be the end result.

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Finally, a parcel that is included in the overall investigation was never owned by Li Tungsten. It is located to the north and west of the Reduction Building and this site was also audited for environmental concerns during the study.

2.2 Nearby Land Uses.

During the course of investigations at the Li Tungsten site, RTP conducted a brief survey of surrounding properties so that all possible pathways for contamination might be found. Land use in the area includes residential, commercial, and industrial (both light and heavy). The specific properties to be described either directly or indirectly border the subject property and do have the potential to impact the site.

Windsor Fuels.

Windsor Fuels is a small fuel oil (#2 distillate) distribution company. The company is located on the corner of Herb Hill Road and Charles Street and is bordered by Glen Cove Creek to the south and Bona-Fide Ready-Mix Corp. to the west. The company has been established for many years and has three large above ground storage tanks that are filled by barge and two smaller tanks. All tanks and piping are above ground and no other chemicals or solvents are kept on the property except the small quantities that are used for basic truck maintenance.

Bona-Fide Ready Mix Corporation.

The Bona-Fide Ready Mix Corporation is a small construction materials producer that deals strictly with concrete and associated materials such as bluestone, sand, gravel, screenings and blends. The company has been in existence at the site for approximately 30 years. It is located on the south side of Herb Hill Road and is bordered by Windsor Fuels to the east, Glen Cove Creek to the south and Li Tungsten to the west. The owner is presently building office space for rent near the entrance to the plant area. One underground storage tank exists on site and contains diesel fuel for the cement mixer trucks. Truck maintenance is conducted on site, therefore, normal maintenance oils and solvents are kept on hand in small quantities.

Chemco Technologies.

Chemco Technologies is located on the north side of Herb Hill Road and is bordered by Flipse Autobody and Li Tungsten to the west, New Street and Charles Street to the east and The Place Street to the north. Generally, Chemco is a manufacturing company that produces photographic film and photographic chemicals. The company has been established for many years. The main office building was once occupied by Columbia Carbon and Ribbon Co. It was bought in 1978-1979 by Chemco. The Columbia site is known to have been partially remediated for hazardous waste and a full Remedial Investigation/ Feasibility Study is currently underway according to Region II DEC. Limited information was available other than that underground and above-ground tanks exist and are registered. Solvents and chemicals are onsite for product manufacturing and equipment maintenance. Information pertaining to accidental spills onsite was not made available.

Flipse Autobody.

Flipse Autobody is a small autobody repair shop located on the north side of Herb Hill Road and is bordered by Li Tungsten to the west and Chemco Technologies to the north and east. The repair shop has been in existence for over three years and the property surrounding the Flipse building is occupied by a number of used automobiles of varying age, size, and condition. Flipse had been storing some of its vehicles on the Li Tungsten property until they were asked to remove them during the course of RTP's investigation.

Flipse autobody is classified as a small generator of hazardous wastes because of materials in use such as lacquers, paints and thinners. These materials and waste solvents are manifested according to applicable regulations prior to their removal from the site. The building housing the repair shop was once a commercial laundry. As a result, a number of underground tanks exist on the property for fuel storage (fuel oil or gasoline). Flipse autobody utilizes an underground tank and above-ground tank, both containing fuel oil, for heating purposes. Remediation of various spills at the autobody facility as well as the laundry have been performed according to Nassau County Department of Health (NCDOH) records.

S and W Laundry.

The S and W Laundry Company is a small commercial laundry occupying the rear section of the structure housing Flipse Autobody. Limited information was available from the company which claims to have been operating for approximately nine years. Dry-cleaning chemicals did not appear to be currently utilized at the facility. Normal operations consist of industrial washing, drying and pressing. NCDOH has reported some accidental spills of hazardous materials at this site and these were apparently remediated.

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Northshore Sportswear.

The Northshore Sportswear company is a small sportswear storage and distribution facility located on the west side of Dickson Lane and it is bordered by Li Tungsten to the south and west and residential housing to the north along Janet Lane. Clothing production does not occur here and the facility is generally used for warehousing. The facility has been in existence since 1965 and deals strictly in sportswear products. No fuel tanks exist on site and no equipment related oils and solvents are stored on site.

Hawkins Fuel Oil.

The Hawkins Fuel Oil Company is a small petroleum distribution company located on the south side of Garvies Point Road and bordered on the east and north by Li Tungsten, and on the south by Glen Cove Creek. The company was established over 50 years ago and at one time utilized the 500,000 gallon fuel storage tank on the Li Tungsten property.

The company currently maintains three above-ground storage tanks for #2 distillate fuel oil, one underground storage tank for diesel fuel and one underground storage tank for gasoline. Only as-necessary truck maintenance occurs at this location because the company has another location that has a maintenance shop. Other chemicals or solvents are not utilized in substantial quantities at this facility.

A small oil spill occurred in January, 1988 at the Hawkins site when a valve seat froze, allowing approximately 100 gallons of fuel to leak. The spill was cleaned up under the supervision of state and county officials.

Town of Glen Cove Sewage Pumping Station.

A small parcel of land located to the west of Hawkins Fuel Oil and bordered by Garvies Point Road to the north, and Glen Cove Creek to the south houses a sewage pumping station for the City of Glen Cove. A locked fence surrounds the station and apparently the pumping station transfers sewage via a pipe under Glen Cove Creek to the Glen Cove Sewage Treatment plant directly across the creek.

LIMCO Manufacturing Corporation.

The LIMCO manufacturing corporation primarily engineers and manufactures sheet metal products for aerospace and industrial purposes. The U. S. military is a large buyer of LIMCO's products. The LIMCO plant occupies a large area located on the north side of Garvies Point Road and is bordered to the east and north by the Li Tungsten facility. LIMCO has occupied this location for over 40 years. One underground storage tank contains fuel oil for heating. Above-ground tanks contain mostly gases for welding and metal work. Solvents and related chemicals are used onsite for metal processing.

Mattiace Petrochemical Co.

Mattiace Petrochemical Co. is a now defunct chemical recycling and neutralization company that borders the western section of the Li Tungsten property (the parcel that is north of Garvies Point Road and west of Dickson Lane). This site is presently a Superfund cleanup site due to alleged chemical dumping and chemical storage in leaking tanks.

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Residential

For the most part, the Li Tungsten property is bordered to the north and west by residential housing in areas other than those previously mentioned. Also, Glen Cove Creek borders the site to the south and is bordered on the extreme western portion by the Garvies Point Preserve.

2.3 Scope of Project.

Given the type of operations that were ongoing at the Li Tungsten facility, it is clear that several cleanup activities need to be performed prior to the development of the site for residential purposes. These are summarized as follows:

1. Testing, neutralization, removal and disposal of tankage and associated liquids.
2. Removal and disposal of analytical laboratory chemicals and related gas cylinders.
3. Identification, removal and disposal of asbestos containing materials.
4. Removal and disposal of stockpiled process residues, as necessary.
5. Demolition and cleanup of on-site structures.
6. Removal, cleanup or treatment of sources of any soil, groundwater or air contamination.
7. Removal and disposal of PCB containing transformers and articles.

The assessments undertaken by RTP were aimed at establishing the magnitude of these cleanup activities and their approximate costs. To accomplish this, RTP utilized the services of several subcontractors performing the tasks indicated below:

- Geraghty & Miller, Inc.
  - -establishment of groundwater monitoring wells
  - -soil gas survey
  - -water quality sampling and analysis
  - -estimation of groundwater cleanup methodologies and costs

- Enviropact Northeast, Inc.
  - -inventory and sampling of stored waste materials
  - -soils sampling
  - -estimation of onsite laboratory cleanup and disposal costs
  - -hazardous materials determinations
  - -estimation of liquid waste removal and disposal costs
  - -estimation of solid waste removal and disposal costs
  - -outfall sampling
  - -estimation of cleanup and disposal costs for transformers

- American Environment Technologies Corp.
  - -inventory of tankage
  - -estimation of tankage cleanup and removal costs
  - -inventory of asbestos
  - -estimation of asbestos cleanup and disposal costs
  - -estimation of structural demolition and disposal costs

- Levine & Robinson, P.C.
  - -review of requirements for closure/remediation
  - -review of potentially applicable environmental statutes
  - -review of liability issues

In some cases, subcontractors retained their own subcontractors to address specific problems within their areas of responsibility. RTP's principal responsibilities included overall project management, supervision of site activities, liaison with Campon Realty Corp., integration and assimilation of subcontractor reports, and cost and remediation summaries.

During the course of RTP's investigations at the site, a number of hazards or potential hazards were identified that were thought to be in need of immediate remediation. These are conditions that, due to their severity, will be corrected to stabilize the site prior to the overall site cleanup activities associated with preparation of the site for development. Glen Cove Development Company has taken the initiative to investigate these conditions and arrange for any necessary remediation. The conditions being investigated are as follows:

- Approximately 20 tanks are in poor condition and need to be drained and cleaned to eliminate the potential of rupture and spillage of their contents.

- Approximately 23 gas cylinders have been found and need to be removed from the site to eliminate potential hazards from the release of pressurized and, in some cases, hazardous chemicals.

- An estimated 131 drums of liquids have been found scattered throughout the site and need to be overpacked in secure containers to eliminate the potential for spillage.

- The three analytical laboratories and related storage facilities need to be lab packed, secured and stored.

- The liner under the site mud pond is broken and leaking. This has caused adverse effects on nearby soils and vegetation. This condition needs to be corrected so that further leakage is prevented.

- Wastes from ore processing, stored in open piles contain high concentrations of heavy metals and, in some cases, may be classified as hazardous. These need to be properly contained.

- Wastes stored within buildings are potentially hazardous and were put indoors to prevent exposure to the elements. Some areas of these buildings have flooded due to roof leakage and the wastes have come into contact with water creating a potential health hazard. The water on the floors needs to be removed and materials should be stored in areas that will remain dry.

- Asbestos hazards exist in and near several buildings due to the deteriorating nature of structures and associated tanks and piping. These conditions are a small part of the total asbestos remediation needed for site cleanup/closure, but they should be immediately remediated for overall safety at the site.

Due to the conditions noted above, RTP and its subcontractors have prepared health and safety plans for conducting activities at the site. The RTP plan is provided in the Appendix to this report, while those of our subcontractors may be found integrated with the rest of their reports on cleanup of the site. It should be stressed that the site is currently in an unstable condition and people performing work at the site must exercise appropriate caution.

The main purpo f this final report is to provide sufficient guidance on costs and sche es for each identified cleanup/remediation activity associ ed with getting a clean bill of health for the site. The seven activitie ummarized earlier in this section are separate from the immediate remedi ion activities described above. Information on the overall site cle p is provided in the following sections, but it must also gnized that two important constraints were in effect during the se of these investigations.

First, the sixty day schedule for the project meant that assessments were exploratory in nature and designed to provide an overview of contamination at the site and not a complete characterization for purposes of conducting the remediation. Second, RTP and its subcontractors conducted this study under a strict confidentiality agreement which restricted coordination with regulatory agencies unless reportable information was uncovered. Obviously, coordination with regulatory agencies will be necessary before the true extent and costs of remediation can be determined.

The following sections of this report contain the key findings of our subcontractors. Section 3 includes a review of regulatory issues related to cleanup as prepared by Levine & Robinson, P.C. Section 4 contains the report of Geraghty & Miller, Inc. on the groundwater, and soil gas investigation. Section 5 contains a report on site residues and special testing (soils, outfalls, PCBs ... performed by Enviropact Northeast, Inc. Section 6 contains American Environment Technologies Corporation (AETC) estimates of asbestos and tank removal costs as well as demolition costs. Finally, the Appendix contains the RTP health and safety plan as well as a detailed discussion of tungsten processing/refining.

SÉCTION 4.0

HYDROGEOLOGIC INVESTIGATION AND SOIL GAS SURVEY

SUMMARY OF METALS CONCENTRATION

	Concentrations in ug/m^3						
	ICP-1 Outdoors	ICP-2 Dice Bldg. Near Drums	ICP-3 Dice Bldg. Slag Pile	ICP-4 Warehouse	ICP-5 Benbow Bldg.	ICP-B Blank*	ACGIH TLV
Cadmium	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	50
Copper	0.05	0.09	0.12	0.06	0.07	0.02	1,000
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	500
Iron	0.18	22.17**	0.45	1.56	4.06	0.36	—
Nickel	<0.01	0.06	0.05	<0.01	0.11	<0.01	1,000
Zinc	0.15	0.14	<0.01	0.12	0.35	0.10	—
Lead	<0.15	<0.15	<0.15	<0.15	<0.15	<0.005	150
Silver	<0.01	0.76	<0.01	<0.01	<0.01	<0.01	100
Sodium	<0.01	1.97	<0.01	<0.01	<0.01	1.26	—
Aluminum	0.50	0.15	0.28	0.64	1.79	0.25	10,000
Manganese	<0.01	<0.01	<0.01	<0.01	2.83	0.09	5,000
Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.50	200
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.0
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	5,000
Phosphorus	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	100
Platinum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1,000
Selenium	0.13	<0.01	<0.01	0.12	<0.01	<0.50	200
Tellurium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	100
Thallium	0.56	0.02	<0.01	<0.01	<0.01	0.03	100
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2,000
Titanium	0.22	<0.01	<0.01	<0.01	<0.01	<0.01	10,000
Vanadium	<0.01	0.04	0.01	0.07	0.19	0.18	50
Yttrium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1,000
Zirconium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	5,000

* units are ug/g.

** this elevated value is believed to have been caused by a particle of rust scale from the drums that had fallen on the filter during sampling.

Volumetric Techniques, LTD.

17 Bernice Drive • Bayport, New York 11705 • (516) 472-4848

To:Laboratory Testing Services
75 Urban Avenue
Westbury NY 11590
334-7004

Date:
Collected:
Received :07/05/89
Completed:08/10/89

Sample Taken By
Client

Reported By:

Additional Lab No.:

Sample:F.C. Hart Associates
7300 Series (1 C F-1)
NY
334-7004

Sample Number 88898907

Parameters	Results mg/L	Parameters	Results mg/L
Cadmium	<0.01		
Copper	0.05		
Chromium, Total	<0.01		
Iron	0.18		
Nickel	<0.01		
Zinc	0.15		
Lead	<0.15		
Silver	<0.01		
Sodium	<0.01		
Aluminium	0.50		
Manganese	<0.01		
Arsenic	<0.01		
Beryllium	<0.01		
Molybdenum	<0.01		
Phosphorus	<0.01		
Platinum	<0.01		
Selenium	0.13		
Tellurium	<0.01		
Thallium	0.56		
Tin	<0.01		
Titanium	0.22		
Vanadium	<0.01		
Yttrium	<0.01		
Zirconium	<0.01		

Run Time : 24 Hours
Pump Rate : 1.26 L/M

Comments

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•Sander R. Sternig•Director of Laboratories•

104284

Volumetric Techniques, LTD.

7 Bernice Drive • Bayport, New York 11705 • (516) 472-4848

To:Laboratory Testing Services
75 Urban Avenue
Westbury NY 11590
334-7004

Date:
Collected:
Received :07/05/89
Completed:08/10/89
Reported By:

Sample Taken By
Client

Additional Lab No.:

Sample:F.C. Hart Associates
7300 Series (I C P-2)
NY
334-7004

Sample Number 88918907

Parameters	Results mg/L	Parameters	Results mg/L
Cadmium	<0.01		
Copper	0.09		
Chromium, Total	<0.01		
Iron	22.17		
Nickel	0.06		
Zinc	0.14		
Lead	<0.15		
Silver	0.76		
Sodium	1.97		
Aluminum	0.15		
Manganese	<0.01		
Arsenic	<0.01		
Beryllium	<0.01		
Molybdenum	<0.01		
Phosphorus	<0.01		
Platinum	<0.01		
Selenium	<0.01		
Tellurium	<0.01		
Thallium	0.02		
Tin	<0.01		
Titanium	<0.01		
Vanadium	0.04		
Yttrium	<0.01		
Zirconium	<0.01		

Run Time : 24:05 Hrs
Pump Rate : 1.183 L/M

Comments

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To:Laboratory Testing Services
75 Urban Avenue
Westbury NY 11590
334-7004

Date:
Collected:
Received :07/05/89
Completed:08/10/89

Sample Taken By
Client

Reported By:

Additional Lab No.:

Sample:F.C. Hart Associates
7300 Series (I C P-3)
NY
334 7004

Sample Number 88938907

Parameters	Results mg/L	Parameters	Results mg/L
Cadmium	<0.01		
Copper	[illegible]		
Chromium, Total	<0.01		
Iron	0.45		
Nickel	0.05		
Zinc	<0.01		
Lead	<0.15		
Silver	<0.01		
Sodium	<0.01		
Aluminum	0.28		
Manganese	<0.01		
Arsenic	<0.01		
Beryllium	<0.01		
Molybdenum	<0.01		
Phosphorus	<0.01		
Platinum	<0.01		
Selenium	<0.01		
Tellurium	<0.01		
Thallium	<0.01		
Tin	<0.01		
Titanium	<0.01		
Vanadium	0.01		
Yttrium	<0.01		
Zirconium	<0.01		

Run Time : 24 Hours
Pump Rate : 1.1764 L/M

Comments

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7 Bernice Drive • Bayport, New York 11705 • (516) 472-4848

To:Laboratory Testing Services
75 Urban Avenue
Westbury NY 11590
334-7004

Date:
Collected:
Received :07/05/89
Completed:08/10/89

Sample Taken By
Client

Reported By:

Additional Lab No.:

Sample:F.C. Hart Associates
7300 Series (I C P-4)
NY
334-7004

Sample Number 88948907

Parameters	Results ng/L	Parameters	Results ng/L
Cadmium	<0.01		
Copper	0.06		
Chromium, Total	<0.01		
Iron	1.56		
Nickel	<0.01		
Zinc	0.12		
Lead	<0.15		
Silver	<0.01		
Sodium	<0.01		
Aluminum	0.64		
Manganese	<0.01		
Arsenic	<0.01		
Beryllium	<0.01		
Molybdenum	<0.01		
Phosphorus	<0.01		
Platinum	<0.01		
Selenium	0.12		
Tellurium	<0.01		
Thallium	<0.01		
Tin	<0.01		
Titanium	<0.01		
Vanadium	0.07		
Yttrium	<0.01		
Zirconium	<0.01		

Run Time : 23:35 Hrs
Pump Rate : 0.700 L/M

Comments

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•Sander R. Sternig•Director of Laboratories•

104287

Volumetric Techniques, LTD.

317 Bernice Drive • Bayport, New York 11705 • (516) 472-4848

To:Laboratory Testing Services
75 Urban Avenue
Westbury NY 11590
334-7770

Date:
Collected:
Received :07/05/89
Completed:08/10/89
Reported By:

Sample Taken By
Client

Additional Lab No.:

Sample:F.C. Hart Associates
7300 Series (I C P S)
Paul Calzolano 334-7770

Sample Number 88958907

Parameters	Results mg/L	Parameters	Results mg/L
Cadmium	0.06		
Copper	0.07		
Chromium, Total	<0.01		
Iron	4.06		
Nickel	0.11		
Zinc	0.35		
Lead	<0.15		
Silver	<0.01		
Sodium	<0.01		
Aluminum	1.79		
Manganese	7.83		
Arsenic	<0.01		
Beryllium	<0.01		
Molybdenum	<0.01		
Phosphorus	<0.01		
Platinum	<0.01		
Selenium	<0.01		
Tellurium	<0.01		
Thallium	<0.01		
Tin	<0.01		
Titanium	<0.01		
Vanadium	0.19		
Yttrium	<0.01		
Zirconium	<0.01		

Run Time : 24 Hours
Pump Rate : 0.8530 L/M

Comments

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Volumetric Techniques, LTD.

317 Bernice Drive • Bayport, New York 11705 • (516) 472-4848

To: Laboratory Testing Services
75 Urban Avenue
Westbury NY 11590
334-7004

Date:
Collected:
Received : 07/05/89
Completed: 08/10/89

Reported By: ______________

Sample Taken By
Client

Additional Lab No.:

Sample Number 88968907

Sample: F.C. Hart Associates
7300 Series (I C P-Blank)
NY
334-7004

Parameters	Results ppm
Cadmium	<0.01
Copper	0.02
Chromium, Total	0.03
Iron	0.36
Nickel	<0.01
Zinc	0.10
Lead	<0.005
Silver	<0.01
Sodium	1.26
Aluminum	0.25
Manganese	0.09
Arsenic	<0.50
Beryllium	<0.01
Molybdenum	<0.01
Phosphorus	<0.01
Platinum	<0.01
Selenium	<0.50
Tellurium	<0.01
Thallium	0.03
Tin	<0.01
Titanium	<0.01
Vanadium	0.18
Yttrium	<0.01
Zirconium	<0.01

Parameters	Results ppm

Comments
* Record For Blank: Not Mailed

REFERENCE NO. 27

NUS CORPORATION AND SUBSIDIARIES — **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
02-8907-28	10/3/89	9:15

DISTRIBUTION:
TO FILE: Li TUNGSTEN

BETWEEN:	OF:	PHONE:
CHARLIE FITZSIMMONS	EPA, EDISON N.J.	(201) 321-6608

AND:
STEVEN OKULEWICZ, EDISON

DISCUSSION:

I ASKED MR. FITZSIMMONS ABOUT THE RECENT AIR TESTING FOR ASBESTOS, METALS AND VOLATILE ORGANICS PERFORMED ON THE Li TUNGSTEN SITE. HE SAID THAT THE RESULTS SHOWED LITTLE OR NO METALS AND VOLATILE ORGANICS. HE WAS UNSURE ABOUT THE TESTING PROCEDURES USED TO COLLECT THE ASBESTOS SAMPLES IN AIR, AS FAR AS THE NUMBER OF SAMPLES THAT SHOULD HAVE BEEN TAKEN AND OVER WHAT PERIOD OF TIME THE SAMPLES WERE TAKEN. HE SAID HE WOULD CHECK INTO ~~[illegible]~~ THIS AND GET BACK TO ME ON THE RESULTS. ALSO, HE SAID THAT THE NUMBER OF ELECTRIC TRANSFORMERS ON SITE HAS NOW REACHED 27, BUT TO USE 23 AS THE REPORTED AMOUNT. LASTLY, HE SUGGESTED I CALL THE NASSAU

ACTION ITEMS:

COUNTY DEPARTMENT OF HEALTH AND CONTACT ROBERT THESSIFELD ABOUT BACKGROUND RADIATION LEVELS ON THE Li TUNGSTEN SITE. HE CAN BE REACHED AT 516-5353313

NUS 067 REVISED 0685

REFERENCE NO. 28

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

NEI nytest environmental inc.

SEP 25 1989

September 21, 1989

Fred C. Hart Assoc.
530 5th Avenue
New York, N.Y. 10036

Attention: Karl Boldt

Nytest is pleased to submit our Project No. 89-15969 Log in No. 2224 on your sample (s) received: 8-17-89.

Test sample (s) associated with this project will be retained for a period of thirty (30) days, unless otherwise instructed.

My staff is available to answer any questions concerning our report and we look forward to serving your future analytical needs.

Very truly yours,

Nytest Environmental Inc.

Remo Gigante

Remo Gigante
Exec. VP

RG:gd
Enc.

104293

box 1518 ▫ 60 seaview blvd., port washington, ny 11050 ▫ (516) 625-5500

Project No.: 89-15969

Log in No.: 1874

P.O. No.: 00265-02-00003-01

Date: July 21, 1989

ANALYTICAL DATA REPORT PACKAGE
FOR

Fred C. Hart Assoc.

530 5th Avenue

New York, N.Y. 10036

Attn: Karl Boldt
Ref: Li Tungsten

SAMPLE IDENTIFICATION	LABORATORY NUMBER	TYPE OF SAMPLE	DATE AND TIME OF SAMPLE COLLECTION

SEE FOLLOWING PAGES FOR RESULTS

REPORT PREPARED BY:
PARAG K. SHAH, Ph. D.
ORGANIC LAB. MANAGER

WE CERTIFY THAT THIS REPORT IS A TRUE REPORT OF RESULTS OBTAINED FROM OUR TESTS OF THIS MATERIAL.

RESPECTFULLY SUBMITTED,
NYTEST ENVIRONMENTAL INC.

DOUGLAS SHEELEY
LABORATORY DIRECTOR

REMO GIGANTE
EXECUTIVE V.P.

bf

104294

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

NEI nytest environmental inc

CHAIN OF CUSTODY RECORD

Page 1 of 1

SHIP TO: Nytest Environmental Inc.
60 Seaview Blvd.
Port Washington, NY 11050
(516) 625-5500
Attn.

REPORT TO: Client Name NYTEST
Address
Phone
Attn.

Project No.	Project Name	Date Shipped	Carrier
99-15969	FRED C HART	8/18/89	FED EX
Sampler: (Signature)	**Analytical Protocol**	**Air Bill No.**	**Cooler No.**

Sample I.D.	Date/Time Sampled		Sample Description	No. Of Containers	ANALYSIS REQUESTED
IOA-11	8/17		SORBENT TUBE	1	INORGANIC ACIDS NIOSH METHOD
IOA-12	8/17		|	1	|
IOA-13	8/17		|	1	|
IOA-14	8/17		|	1	|

Relinquished by (Signature)	Date / Time	Rec'd By (Signature)	Date / Time
[illegible signature]	[illegible] / [illegible]		
Print Name: [illegible] FLETCHER		Print Name	
Relinquished by (Signature)	Date / Time	Rec'd by (Signature)	Date / Time
Print Name		Print Name	
Relinquished by (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time
Print Name		Print Name	

Special Instructions/Comments

104295

Client Retains Yellow Copy Only

D.C. No.: E 0248

HART

Name: KARL BOLDT
Affiliation: FRED C. HART ASSOCIATES, INC.
Phone: (212) 840-3990
Address: 570 FIFTH AVE. NEW YORK, NY 10036
Client/Job No: 00265-02-00003-01
Job Name: LI TUNGSTEN Location: GLEN COVE, NY

CHAIN OF CUSTODY RECORD

Sample No.	Lab I.D. No.	Date	Time	Matrix	No. of Containers	Analysis Requested/Remarks
IOA 11		8/17/89	5:00PM	SORBENT TUBE	1	INORGANIC ACIDS NIOSH METHOD
IOA 12						
IOA 13						
IOA 14						

Comments:

Relinquished by: Karl Boldt Date: 8/17/89 Shipment Method: Hand
Time: 6:15PM Airbill No.:

Received by: [illegible] Date: 8/17/89 Relinquished by: Date:
Time: 6:15PM Time:

Received by: Date: Relinquished by: Date:
Time: Time:

Final Disposition of Samples:

Received by: Date: Time:

HART Form 400 Pink/Field Copy - Yellow/Lab Copy - White/Original - To be returned with results.

104296

Re: Inorganic Acids Air Monitoring Results
Li Tungsten

Jim,

Sample IOA-14 was the blank. Only fluoride (presumably HF) showed up higher than the blank. ACGIH TLV is 2.5 mg/m³ (2,500 ug/m³). Concentrations measured were as follows.

Sample No.	Location	(ug F)*	(ug/m³ F)
IOA-11	Lab S	1.91	16.5
IOA-12	Lab NW	1.41	12.0
IOA-13	Lab E	0.12	1.07
IOA-14	Blank	1.37	--

* Blank value subtracted from total analytical result.

104297

TABLE OF CONTENTS

List of Figures

1.0 INTRODUCTION

The Li Tungsten facility (herein after referred to as the "Site") is located at 63 Herb Hill Road, Glen Cove, New York. The Site is 26 acres and consists of three separate parcels. The main operations at the Site were conducted on the parcel bordered by Glen Cove Creek to the south and Herb Hill Road to the north and a second parcel to the west of Dickson Lane. The parcel bordered by Herb Hill Road on the south and Dickson Lane on the west contains no facility structures. A map of the Site is provided in Figure 1.

Based on documents in the possession of the Glen Cove Development Company (GCDC) and obtained from records maintained at the Site the following background information was developed. The Site was operated from the 1940's to approximately 1985 by the Wah Chang Trading Company and its wholly owned subsidiary the Li Tungsten Corporation. The operation involved the processing of ore and scrap tungsten concentrates to ammonium paratungstate (APT) and subsequently formulating APT to metal tungsten powder and tungsten carbide powder. Other specialty products such as tungsten carbide powder plus cobalt and other material for plasma spraying; tungsten titanaium carbide powder; tantalum carbide powder; tungsten spray powder; crystalline tungsten powder; and, molybdenum spray powder were also produced.

The property was acquired by GCDC in 1984 and leased to The Li Tungsten Corporation. The market for tungsten was apparently depressed by the 1980's and operations at the Li Tungsten facility had slowed by this time. The Li Tungsten operation declared bankruptcy in 1985.

GCDC is a New York State general partnership jointly owned by Old Court Joint Ventures, Inc. and Old Court Holdings Corporation, Inc., both of which in turn are wholly-owned subsidiaries of Old Court Savings and Loan, Inc. (in Receivership) located in Maryland.

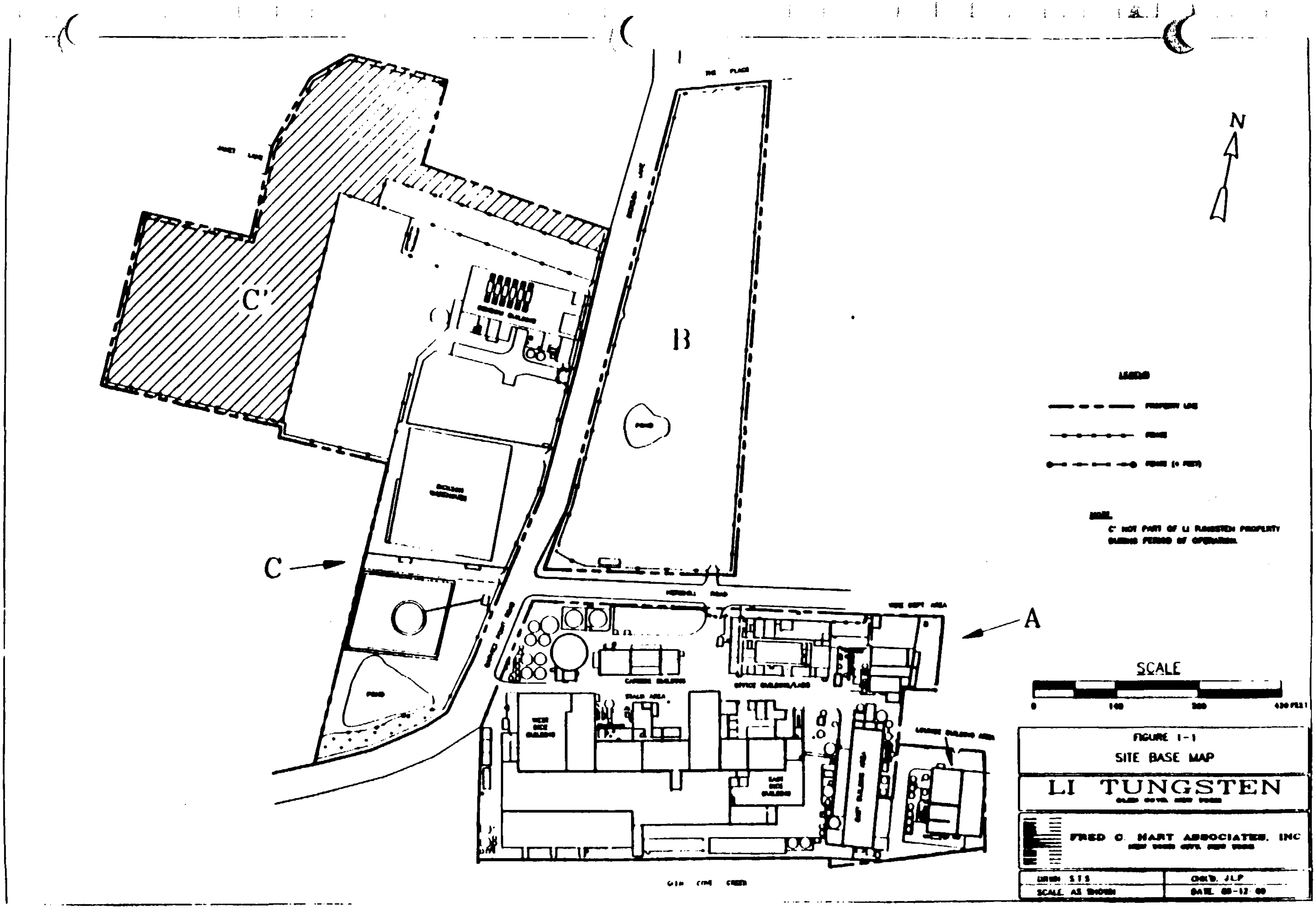

Figure 1

Li Tungsten Facility

104300

Fred C. Hart Associates, Inc. (HART) was retained by GCDC to coordinate implementation of interim actions to address certain environmental conditions at the Site. This scope of work (SOW) sets forth those proposed interim actions which were identified by the United States Environmental Protection Agency (USEPA) Region II pursuant to its authority under The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. Section 9601 et. seq. This scope of work is prepared as an attachment to the USEPA Administrative Order on Consent, Index No. II CERCLA-90215. The work proposed in this document will be consistent with practices described in:

"Characterization of Hazardous Waste Sites". NTIS PB87-120291, August 1985.

"Guidance Document for Clean-up of Surface Tank and Drum Sites". NTIS PB87-110672, May 1985.

"Drum Handling Practice at Hazardous Waste Sites". NTIS PB86-165362 OSHA, January 1986.

"29 CFR 1910.120 OSHA Regulations."

"EPA Standard Operating Safety Guidelines". OSWER 10/88.

All sampling and analyses performed by respondent shall conform to the USEPA quality assurance/quality control (QA/QC) and chain of custody procedures and in conformance with the USEPA publication entitled, Test Methods for Evaluating Solid Waste (SW-846 November 1986 as updated) and the USEPA document entitled, Guidance for Preparation of Combined Work/QA Project Plan for Environmental Monitoring (OAMS 005/80).

2.0 PURPOSE

This SOW outlines plans for interim actions at the Site. These interim actions were identified by the USEPA because of concerns regarding the stability and security of the Site. GCDC proposes to undertake interim actions identified in this document pursuant to the aforementioned administrative order.

As stated during previous discussions with the USEPA, GCDC, through the Receivership, must comply with strict guidelines regarding the allocation of funds. To obtain approval for funding for one or more items, a fairly accurate cost estimate or range is required. The Circuit Court in Baltimore monitoring the Receivership must authorize expenditure of any funds. As a result, an order must be signed by the Circuit Court in Baltimore to formally allocate the funds to complete these interim actions. The court is expected to issue this order by June 12, 1989. GCDC through the receivership has obtained approval for a few of these items and has completed or is in the process of completing some of these actions.

3.0 INTERIM ACTIONS

The following interim actions were discussed at two meetings with the USEPA. Those interim actions which have already been completed (i.e. MEKP and cylinder removal) are not discussed or included on the schedule. The remaining interim actions and the plans for implementation are discussed in the following sections. A schedule for completion of these actions is also included.

3.1 Site Security

Based upon the USEPA reconnaissance of the Site, security was identified to be a major concern. Because of damage to the perimeter fence or the absence of a fence in some areas, access to the Site could not be controlled. Although one 24 hour guard is stationed and periodically patrols in a marked car outside the boundary of the Site, the USEPA believes that certain areas may not be readily accessible to a lone security patrol (northwestern boundary of the Site parcel just west of Dickson Lane). Therefore EPA requested that in addition to GCDC proceeding with fencing, the security patrol at the Site be upgraded.

3.1.1 Proposed Action. GCDC is proceeding with securing the Site perimeter with fencing. A priority will be given to installing a line of fence to impede access along the northwestern perimeter of the parcel located west of Dickson Lane. As of this date, all repairs have been made to the existing fence and gates. The fence posts along the northwestern parcel have been installed. Fencing in this area and between Chemco and the Site parcel north of Herb Hill Road is expected to be completed by June 23, 1989. Furthermore, GCDC has placed another security guard in a marked vehicle for the 8-hour shift from approximately 4:00 p.m. to midnight. This guard is stationed along the Site perimeter on Dickson Lane. A security presence in this area, for the period of time proposed, is intended to dissuade trespassers from entering the northwest Site parcel. During the course of implementing one or more of the interim actions, workers will be on-site during the day and it is less likely that unauthorized individuals will trespass. As certain interim actions are completed, (i.e. fencing completion etc.) GCDC would like the opportunity to downgrade the security force. Funds which do not have to be expended on guards can be targeted for additional stabilization and/or removal actions.

3.2 Radioactive Materials

USEPA has recommended the collection, staging and subsequent removal of isolated drums or containers of residual ore or slag that has exhibited elevated radioactivity readings. These drums or containers have been identified via preliminary radiological surveys conducted by Nassau County Department of Health (NCDOH) and listed in their status reports. The USEPA also did some preliminary radiological surveying and will provide maps depicting the location of the containers it identified to the extent it differs from those items in the NCDOH report.

3.2.1 Proposed Action. The NDL Organization has been contracted to undertake a comprehensive, real-time radiological survey both inside and outside the Site buildings. The purpose of this survey would be to identify any areas where on-site worker access needs to be restricted as a result of radioactivity levels and/or any special protective measures to be taken while working in those areas. Since worker access to many areas of the Site will be required to complete other interim actions or future remedial work, this radiological survey is prudent and necessary. With the USEPA approval, this survey will include:

1) a gamma ray survey of the property and buildings on an approximate 25 foot x 25 foot grid;

2) Fixed and removable alpha radiation survey of buildings;

3) Collection and gamma spectral analysis of process material (and mud pond sediments;

4) Preparation of report summarizing the findings of the survey.

During the course of this radiological survey, readily accessible drums or containers which exhibit elevated readings will be moved to an agreed upon on-site location to which access can be restricted. Based on the results of the survey, up to fifteen (15) containers (including the ones previously identified at the Site) which are characterized as low level radioactive waste will be removed for disposal.

3.3 Laboratory Chemicals

Small quantities of identifiable laboratory chemicals have already been secured and placed in overpacks. In addition, small quantities of unidentified laboratory chemicals remain in some areas. USEPA has recommended characterization, overpacking and disposal, as needed, for all the laboratory chemicals.

3.3.1 Proposed Action. The existing laboratory overpacks will be removed for disposal. The chemicals in existing overpacks may have to be redistributed and placed in special containers. All existing laboratory overpacks which can be removed, as is, by ENSCO (the contractor who completed the overpacking) to its disposal facility will be done. Any remaining laboratory overpacks will be repackaged and reinventoried by the selected disposal contractor. Any packing lists in compliance with the contractors packing guidelines will be spot checked for accuracy. The existing laboratory overpacks will be moved to a fully permitted transfer facility to await approval of the disposal site. The remaining unindentified laboratory chemicals will be characterized in the field. Up to 200 additional bottles, jars and/or containers will undergo a fingerprint analysis in an isolated area of the Site. This fingerprinting will be done under a portable fume hood. Based on these results, the chemicals will be appropriately packaged for off-site disposal.

3.4 Drum Inventory and Removal

USEPA has recommended the characterization and removal of drums containing chemicals (solid and liquid) at the Site. Specifically, USEPA referred to 50 to 100 units located in the Dickinson Warehouse area (northwest parcel).

3.4.1 Proposed Action. A number of drums containing liquids had been identified in the report prepared by RTP Environmental Associates, Inc. in May 1988. Based on the RTP report, approximately 108 drums of liquids were moved to inside the Dice Building (Main Facility Property). EPA's identification of 50 to 100 units (containers, drums, etc.) containing solid and liquids is in addition to the drums already placed in the Dice Building.

Based on this information, up to 250 drums of liquid/solid chemicals will be characterized for removal and disposal. The drummed contents will be screened for radioactivity in conjunction with the characterization for the purpose of bulking prior to detailed laboratory analysis for disposal. It is assumed that 125 drums will be characterized as waste water treatment candidates and 125 drums will be characterized as incineration candidates.

3.5 Tank Characterization

USEPA has recommended characterization of any liquids remaining in tanks at the Site. The purpose of this characterization would be to determine if the contents of any tank warrants immediate removal; to identify the types of materials present in different locations so that the appropriate emergency services units are aware of materials on-site; and, ultimately, to ascertain the most practical treatment and disposal options for these liquids.

3.5.1 Proposed Action. Currently, the only inventory of the tanks on the Site and their contents is in the RTP report. According to the report, this inventory was based on a review of records at the Site and a walk-through with a former employee of Li Tungsten. In many instances the tank size and contents (as of May 1988) is indicated. This information does not preclude the need for a more definitive characterization. To accomplish this, representative on-site testing for parameters, including but not limited to, RCRA characteristics, metals and screening for radioactive materials may be the most practical approach. A request for bid (RFB) for this characterization will be solicited (see schedule). The approach and methodology to be used for this characterization will be provided to the USEPA prior to implementation. The results of the characterization will serve to identify the nature of the materials in tanks, their location and evaluate further actions.

3.6 Asbestos

USEPA stated its concern with the presence of large quantities of asbestos in certain areas of the Site. These concerns previously involved worker exposure.

3.6.1 Proposed Action. An asbestos abatement/removal project is more consistent when a long-term remedial program is implemented at the Site. The major concern regarding asbestos is to on-site workers during field activities. Therefore, in order to protect workers, access to areas which are known to contain large quantities of friable asbestos (Lounge Building Area) will be limited. These areas will be designated on a Site map in the Health and Safety Plan. Additional protective gear will be used by personnel working in these areas. Consistent with OSHA requirements, HART will set up ambient air sampling for a specific time period in the vicinity of these areas to check whether fibers are being dispersed into the air stream. This work will be in addition to health and safety monitoring which will be implemented during the duration of on-site activities.

Two high volume air samples will be analyzed by phase contrast microscopy (PCM) to determine an eight hour time weighted average of asbestos concentration. PCM only determines the total number of fibers and does not distinguish between types of material. If OSHA standards are exceeded using PCM, another two air samples (taken at the same time) will be analyzed by transmission electron microscopy (TEM). In addition, between 25 to 50 bulk asbestos samples will be collected for analysis via polarized light microscopy with dispersion staining (PLMDS). Three to five samples will be collected of each homogeneous area and an estimate of the volume of material sampled, its percent asbestos, location and condition will be presented on a Site map.

3.7 Creek Sediment Sampling

USEPA has recommended that samples of sediment from the creek be obtained for analysis of appropriate radionuclides. The agency proposed these samples be obtained in the vicinity of the outfalls from the Site. According to available information, five (5) outfalls discharged from the Site to the creek when the facility operated. Therefore, five (5) sediment samples were requested.

3.7.1 Proposed Action. A creek sediment sampling program is premature and more in line with a long-term remedial study not a short, interim action. Nevertheless, five (5) creek sediment samples will be collected for radioactivity analysis only. The sampling and analysis will be done by personnel associated with New York University Medical Center, Institute of Environmental Medicine. The individuals will do the work as consultants to GCDC and not under the banner of the University. One sediment sample will be taken in the creek, east of the Site while three sediment samples will be collected in the vicinity of the outfalls and one sediment sample will be obtained from the western portion of the creek.

The samples will be placed in aluminum cans and assayed, (after one to two weeks), for gamma-emitting radionuclides (^{40}K, ^{137}Cs, ^{226}Ra-daughters, ^{228}Th-daughters and ^{228}Ra-daughters) using an intrinsic Ge detector. A portion of the sample will be removed and assayed radiochemically for ^{234}U, ^{238}U, ^{232}Th, ^{230}Th and ^{228}Th. Although the sample collection will be completed in a short period of time, the radionuclide analysis and report will require approximately 3 to 4 months.

3.8 Transformer Inventory and Characterization

USEPA has recommended the inventory of transformers at the Site and characterization of the oils inside the transformers. During its inspection, one transformer located outside a building on the main facility property appeared to have leaked onto the asphalt surface.

3.8.1 Proposed Action. HART has identified sixteen (16) transformers at the Site. The previous RTP report indicated twenty-one (21) transformers and two (2) oil circuit breakers. The contractor who completed the survey for RTP (Empire Environmental Services) will be contacted to account for these five (5) additional transformers and two (2) oil circuit breakers. In any event, a sample oil from the identified transformers will be collected for PCB analysis. Based on these analyses, arrangements for disposal and associated costs will be prepared.

3.9 Mercury Clean-up

An area inside the Benbow (Reduction) building was identified by the USEPA field reconnaisance team to have mercury on the floor. USEPA recommended this area be cleaned.

3.9.1 Proposed Action. Once the dimension of the area is defined, a field team in protective clothing will spread an absorbant lead based salt on the floor surface. The floor surface will be swept and the material placed in a plastic 55-gallon drum. All equipment used in the cleaning will also be placed in the drum. A representative sample (wipe or sweep) will be collected for mercury analysis after the clean-up is completed.

APPENDIX B

SCHEDULE OF COMPLIANCE

**INTERIM ACTIONS
AT THE
LI TUNGSTEN SITE
63 HERB HILL ROAD
GLEN COVE, NEW YORK**

Prepared by:

**FRED C. HART ASSOCIATES, INC.
530 FIFTH AVENUE
NEW YORK, NEW YORK 10036-5166**

July 17, 1989

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List of Figures

1.0 ESTIMATED SCHEDULE

An estimated schedule for the implementation of the interim actions described in this SOW is presented in Figure 2. The time lines include mobilization, field activities and necessary laboratory analysis. Footnotes for each of the listed items are also included. Although the estimated schedule indicates that work will start once an interim order is established, a number of items are ongoing or have already been completed. To the extent practical, interim actions wil be completed in short time frames.

HART will provide a bi-monthly status report to the USEPA which summarizes the on-going or completed activities and transmits relevant documentation. The recipients of these status reports are indicated in the order on consent.

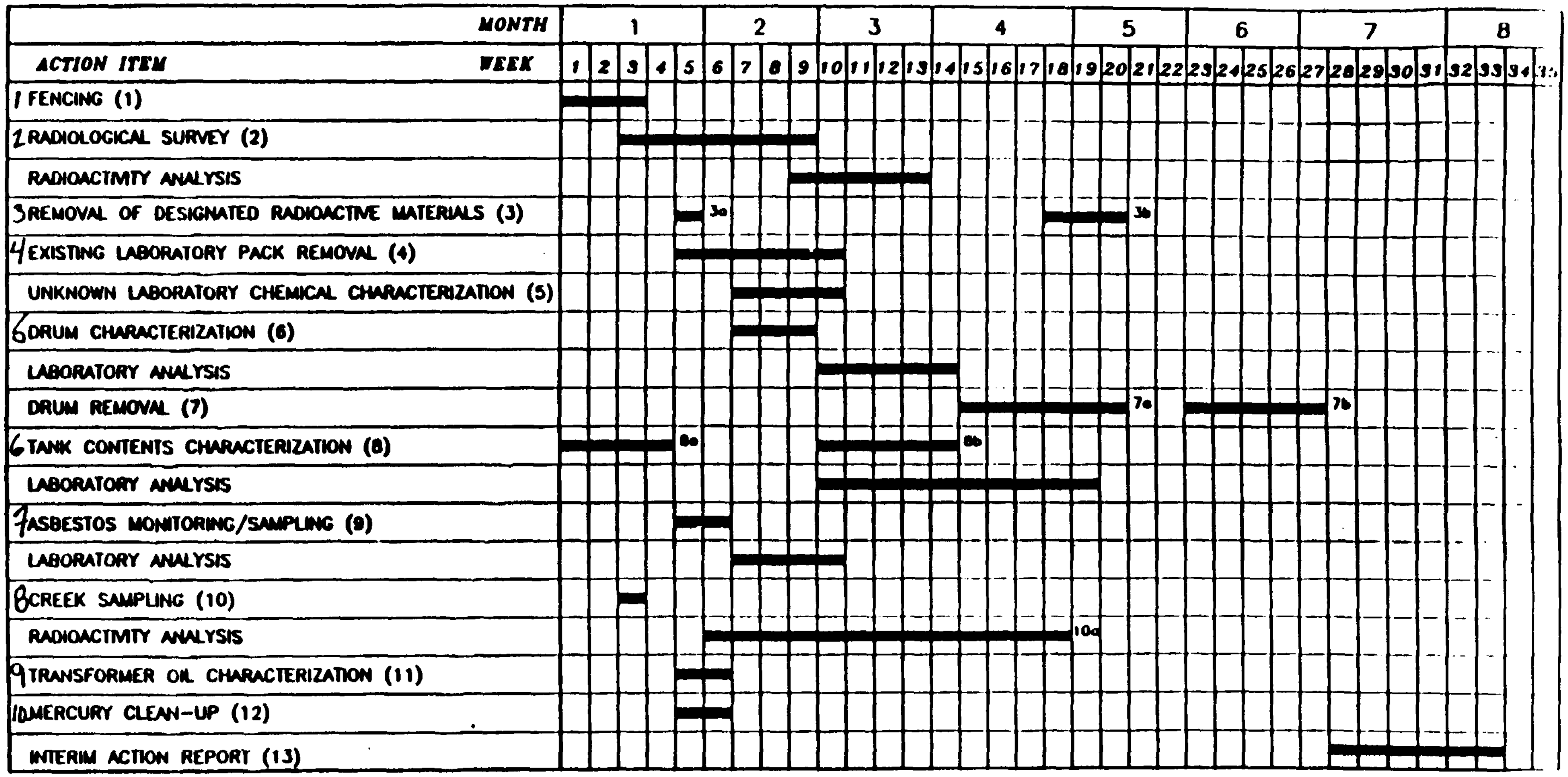

FIGURE 2

Estimated Schedule
Interim Actions at Li Tungsten

FRED C. HART ASSOCIATES, INC

104312

Notes:

* Start date coincides with interim order

1: Fencing is ongoing. Estimated completion is June 23rd. Security guards (one 24 hr. and one 8 hr.) are also provided at the Site.

2: Radiological survey to be conducted by the NDL Organization. Currently scheduled to begin the week of June 19, 1989.

3: Previously identified containers exhibiting elevated radioactivity readings will be staged in the wire plant. Once survey is completed, up to fifteen containers, characterized as low level radioactivity waste, will be removed from the Site.

3a: This time line reflects the staging of containers exhibiting elevated radioactivity levels in the wire plant building.

3b: This time line reflects removal of up to fifteen containers characterized as low level radioactive waste once laboratory analysis and disposal site arrangements are completed.

4: Initiation of laboratory pack removal to immediately follow radiological survey time frame allows for mobilization, random checking of packing inventories against drum contents, repackaging if necessary, and removal to appropriate staging or disposal facility.

5: Unknown laboratory chemical characterizations will be completed in an isolated area using a fume hood.

6: Drum characterization assumes a total of 250 drums (125 for waste water treatment analysis and 125 for incineration analysis).

7: Drum removal (see 6) to begin following receipt of detailed laboratory analysis.

7a: Time frame to review laboratory results of drums and arranging for appropriate disposal of up to 250 drums.

7b: Time frame to remove up to 250 drums to an approved disposal facility.

8: Tank contents characterization includes identifying which tanks contain liquids and their approximate volumes.

8a: Time frame to soliciting competitive bids, review and select contractor and notify USEPA prior to implementation.

8b: Time frame to complete the tank characterization.

9: Time frame, to monitor/sample for asbestos. Includes two high volume air samples and between 25 and 50 bulk samples for laboratory analysis.

10: Creek Sampling will be scheduled.

10a: Radionuclide analysis and reporting to be completed in approximately 3 months

11: Characterization of transformer oils to follow radiological survey.

12: Mercury on floor of Benbow Building to be cleaned.

13: Summary Report of completed Interim Actions.

nytest environmental inc.

ORGANIC DATA REPORTING QUALIFIERS

U Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected. The number is the minimum attainable detected limit for the sample.

J Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g.: If limit of detection is 10 ug/l and a concentration of 3 ug/l is calculated, report as 3J.)

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

D This flag indentifies all compounds indentified in an analysis at a secondary dilution factor.

Note: Data on soil samples expressed on a dry weight basis.

Contractor: NYTEST ENVIRL .ITAL INC.
Lab Sample ID No: N9-9559
Sample Matrix: TUBE
Data Release Authorized By.

Project No: 89-15959
Date Sample Received: 07/7/89

VOLATILE COMPOUNDS

Concentration: Low Medium (Circle One)
Date Extracted/Prepared: NA
Date Analyzed: 07/14/89
Conc/Dil Factor: 0.1 pH:
Percent Moisture (Not Decanted): NA

CAS Number		Total ug
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	0.6
67-64-1	Acetone	1.0 U
75-15-0	Carbon Disulfide	0.5 U
75-35-4	1,1-Dichloroethene	0.5 U
75-34-3	1,1-Dichloroethane	0.5 U
540-59-0	Total-1,2-Dichloroethene	0.5 U
67-66-3	Chloroform	0.2 J
107-06-2	1,2-Dichloroethane	0.5 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.3 J
56-23-5	Carbon Tetrachloride	0.1 J
108-05-4	Vinyl Acetate	1.0 U
75-27-4	Bromodichloromethane	0.5 U

CAS Number		Total ug
79-34-5	1,1,2,2-Tetrachloroethane	0.5 U
78-87-5	1,2-Dichloropropane	0.5 U
10061-02-6	Trans-1,3-Dichloropropene	0.5 U
79-01-6	Trichloroethene	0.5 U
124-48-1	Dibromochloromethane	0.5 U
79-00-5	1,1,2-Trichloroethane	0.5 U
71-43-2	Benzene	0.5 U
10061-01-5	cis-1,3-Dichloropropene	0.5 U
110-75-8	2-Chloroethylvinylether	1.0 U
75-25-2	Bromoform	0.5 U
591-78-6	2-Hexanone	1.0 U
108-10-1	4-Methyl-2-Pentanone	1.0 U
127-18-4	Tetrachloroethene	0.5 U
108-88-3	Toluene	0.5 U
108-90-7	Chlorobenzene	0.5 U
100-41-4	Ethylbenzene	0.5 U
100-42-5	Styrene	0.5 U
	Total Xylenes	0.5 U
	Total Dichlorobenzene	3.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U), based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

ORGANICS ANALYSIS DATA SHEET

Contractor: NYTEST ENVIRONMENTAL INC.
Project No: 89-15969

SAMPLE NUMBER: VOC-3
LAB SAMPLE ID NO: N9-9559

Tentatively Identified Compounds

CAS Number	Compound Name	Fraction	RT	Total ug
1	UNKNOWN	VOA	2:54	3.7 J
2	UNKNOWN	VOA	3:34	2.3 J
3	UNKNOWN	VOA	6:04	4.6 J
4	TRICHLOROFLUOROMETHANE	VOA	10:20	1.9 J
5	2-METHYLBUTANE	VOA	14:28	0.8 J
6	FREON	VOA	14:50	1 J
7	UNKNOWN ALKANE	VOA	16:20	0.8 J
8	2,2-DIMETHYL 1,3-DIOLOXANE	VOA	19:20	1.6 J
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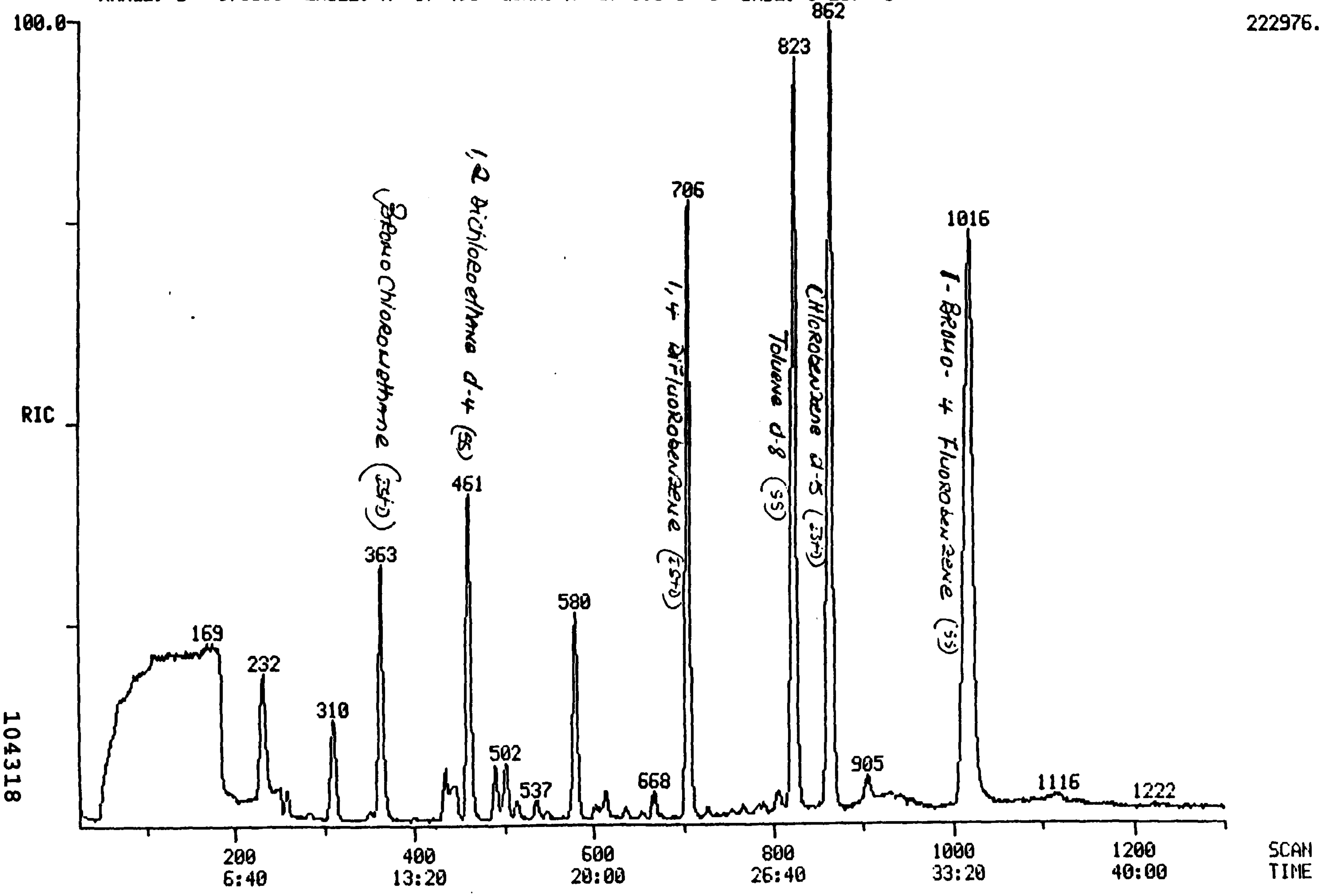
RIC
07/14/89 11:47:00
DATA: D8946 #1016
CALI: D8946 #2
SCANS 25 TO 1300
SAMPLE: F.C.HART,VOC-3/N9-9559,REC'D 7/7/89
CONDS.: TUBE/2MLS,100UL/5ML INSTD
RANGE: G 1,1300 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



104318

SAMPLE NUMBER: VO?-

Contractor: NYTEST ENVIRONMENTAL INC.
Lab Sample ID No: N9-9550
Sample Matrix: TUBE
Data Release Authorized By:

Project No: 89-15969
Date Sample Received: 07/7/89

VOLATILE COMPOUNDS

Concentration: Low Medium (Circle One)
Date Extracted/Prepared: NA
Date Analyzed: 07/14/89
Conc/Dil Factor: 0.1 pH:
Percent Moisture (Not Decanted): NA

CAS Number		Total ug
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	2.6
67-64-1	Acetone	1.0 U
75-15-0	Carbon Disulfide	0.5 U
75-35-4	1,1-Dichloroethene	0.5 U
75-34-3	1,1-Dichloroethane	0.5 U
540-59-0	Total-1,2-Dichloroethene	0.5 U
67-66-3	Chloroform	0.3 J
107-06-2	1,2-Dichloroethane	0.5 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.3 J
56-23-5	Carbon Tetrachloride	0.2 J
108-05-4	Vinyl Acetate	1.0 U
75-27-4	Bromodichloromethane	0.5 U

CAS Number		Total ug
79-34-5	1,1,2,2-Tetrachloroethane	0.5 U
78-87-5	1,2-Dichloropropane	0.5 U
10061-02-6	Trans-1,3-Dichloropropene	0.5 U
79-01-6	Trichloroethene	0.5 U
124-48-1	Dibromochloromethane	0.5 U
79-00-5	1,1,2-Trichloroethane	0.5 U
71-43-2	Benzene	0.5 U
10061-01-5	cis-1,3-Dichloropropene	0.5 U
110-75-8	2-Chloroethylvinylether	1.0 U
75-25-2	Bromoform	0.5 U
591-78-6	2-Hexanone	1.0 U
108-10-1	4-Methyl-2-Pentanone	1.0 U
127-18-4	Tetrachloroethene	0.5 U
108-88-3	Toluene	0.5 U
108-90-7	Chlorobenzene	0.5 U
100-41-4	Ethylbenzene	0.5 U
100-42-5	Styrene	0.5 U
	Total Xylenes	0.5 U
	Total Dichlorobenzene	3.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE If the result is a value greater than or equal to the detection limit, report the value.

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J Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

nytest environmental inc

ORGANICS ANALYSIS DATA SHEET

Contractor: NYTEST ENVIRONMENTAL INC.
Project No: 89-15969

SAMPLE NUMBER: VOC-4
LAB SAMPLE ID NO: N9-9560

Tentatively Identified Compounds

CAS Number	Compound Name	Fraction	RT	Total ug
1	UNKNOWN	VOA	3:02	7.1 J
2	UNKNOWN	VOA	3:14	0.7 J
3	UNKNOWN	VOA	3:36	7.1 J
4	UNKNOWN	VOA	4:08	4.4 J
5	UNKNOWN	VOA	4:18	2.0 J
6	UNKNOWN	VOA	4:32	5.5 J
7	TRICHLOROFLUOROMETHANE	VOA	10:18	4.7 J
8	UNKNOWN ALKANE	VOA	16:22	1.4 J
9	2,2-DIMETHYL 1,3-DIOXOLANE	VOA	19:18	1.7 J
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nytest environmental inc

ORGANICS ANALYSIS DATA SHEET

SAMPLE NUMBER: VOC-2
LAB SAMPLE ID NO: N9-9558

Contractor: NYTEST ENVIRONMENTAL INC.
Project No: 89-15969

Tentatively Identified Compounds

CAS Number	Compound Name	Fraction	RT	Total ug
1	UNKNOWN	VOA	2:46	6.2 J
2	UNKNOWN	VOA	3:18	12.5 J
3	UNKNOWN	VOA	3:44	14 J
4	UNKNOWN	VOA	4:16	8 J
5	UNKNOWN	VOA	4:24	4 J
6	UNKNOWN	VOA	4:42	8 J
7	UNKNOWN	VOA	4:54	7 J
8	UNKNOWN ACID	VOA	5:10	6 J
9	UNKNOWN	VOA	6:02	0.7 J
10	UNKNOWN	VOA	6:16	1.7 J
11	UNKNOWN	VOA	10:24	1 J
12	UNKNOWN	VOA	13:16	1.3 J
13	FREON	VOA	14:54	1.4 J
14	UNKNOWN	VOA	16:46	0.7 J
15	1,3-DIMETHYL 2,2-DIOLOXANE	VOA	19:22	1 J
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Contractor: NYTEST ENVIRONMENTAL INC.
Lab Sample ID No: N9-9558
Sample Matrix: TUBE
Data Release Authorized By:

Project No: 89-15969
Date Sample Received: 07/7/89

VOLATILE COMPOUNDS

Concentration: Low Medium (Circle One)
Date Extracted/Prepared: NA
Date Analyzed: 07/14/89
Conc/Dil Factor: 0.1 pH:
Percent Moisture (Not Decanted): NA

CAS Number		Total ug
74-87-3	Chloromethane	1.0 U
74-83-9	Bromomethane	1.0 U
75-01-4	Vinyl Chloride	1.0 U
75-00-3	Chloroethane	1.0 U
75-09-2	Methylene Chloride	0.6 B
67-64-1	Acetone	1.0 U
75-15-0	Carbon Disulfide	0.5 U
75-35-4	1,1-Dichloroethene	0.5 U
75-34-3	1,1-Dichloroethane	0.5 U
540-59-0	Total-1,2-Dichloroethene	0.5 U
67-66-3	Chloroform	0.5 U
107-06-2	1,2-Dichloroethane	0.5 U
78-93-3	2-Butanone	1.0 U
71-55-6	1,1,1-Trichloroethane	0.5 U
56-23-5	Carbon Tetrachloride	0.5 U
108-05-4	Vinyl Acetate	1.0 U
75-27-4	Bromodichloromethane	0.5 U

CAS Number		Total ug
79-34-5	1,1,2,2-Tetrachloroethane	0.5 U
78-87-5	1,2-Dichloropropane	0.5 U
10061-02-6	Trans-1,3-Dichloropropene	0.5 U
79-01-6	Trichloroethene	0.5 U
124-48-1	Dibromochloromethane	0.5 U
79-00-5	1,1,2-Trichloroethane	0.5 U
71-43-2	Benzene	0.5 U
10061-01-5	cis-1,3-Dichloropropene	0.5 U
110-75-8	2-Chloroethylvinylether	1.0 U
75-25-2	Bromoform	0.5 U
591-78-6	2-Hexanone	1.0 U
108-10-1	4-Methyl-2-Pentanone	1.0 U
127-18-4	Tetrachloroethene	0.5 U
108-88-3	Toluene	0.5 U
108-90-7	Chlorobenzene	0.5 U
100-41-4	Ethylbenzene	0.5 U
100-42-5	Styrene	0.5 U
	Total Xylenes	0.5 U
	Total Dichlorobenzene	3.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

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C This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

z

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

REPORT OF ANALYSIS

Date: September 21, 1989

Project No.: 89-15969
Log in No: 2224

Client: Fred C. Hart Associates
Material: (4) Waste Samples
Identification: As below (sample received: 08/17/89)
Client's Order No: 00265-02-00003-01

We find as follows:

Sample Identification		Chloride	Fluoride	Nitrate	Sulfate
		Parameter(s) — Anion Concentration, ug			
IOA-11	N901777	1.86	3.28	0.09	1.01
IOA-12	N901778	0.41	2.78	< 0.09	< 0.9
IOA-13	N901779	0.55	1.49	< 0.09	< 0.9
IOA-14	N901780	2.82	1.37	0.10	1.0

Note: The samples were analyzed for inrganic acids according to NIOSH method 7903. Results are given as micrograms of the anion in the sample front and back sorbant sections.

REPORT PREPARED BY:
MARLIN McCRICKARD
INORGANICS LAB MANAGER

DOUGLAS SHEELEY
LABORATORY DIRECTOR

We certify that this report is a true report of results obtained from our tests of this material.

Respectfully submitted,

Nytest Environmental, Inc.

Remo Gigante, Exec. V.P.

To: Fred C. Hart Associates
530 Fifth Avenue
New York, NY 10036

Att: Karl Boldt
Ref: LI Tungsten

ma

104323

REFERENCE NO. 29

NUS CORPORATION AND SUBSIDIARIES — TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8907-78	10/23/89	1415

DISTRIBUTION:
TO FILE: Li TUNGSTEN

BETWEEN:	OF:	PHONE:
ROBERT THESSIFELD	NASSAU COUNTY DEPT. OF HEALTH	(516) 535-3313

AND:
STEVEN OKULEWICZ

DISCUSSION:

I ASKED MR. THESSIFELD ABOUT BACKGROUND RADIATION RESULTS FOR THE Li TUNGSTEN SITE. HE SAID THAT NO ON-SITE RADIATION SURVEYS WERE EVER DONE TO DETERMINE BACKGROUND RADIATION, BUT OFF-SITE SOIL SAMPLES WERE TESTED AND HAD "NEGATIVE RESULTS."

ACTION ITEMS:

NUS 067 REVISED 0685

104325

CONFIDENTIAL-NOT FOR PUBLIC RELEASE

HRS

	S	S^2
Groundwater Route Score (S_{gw})	83.67	7000.67
Surface Water Route Score (S_{sw})	9.45	89.30
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		7089.97
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		84.20
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		48.67

WORKSHEET FOR COMPUTING S_M

PRO

	S	S^2
Groundwater Route Score (S_{gw})	100	10,000
Surface Water Route Score (S_{sw})	10.91	119.03
Air Route Score (S_a)	58.46	3417.57
$S_{gw}^2 + S_{sw}^2 + S_a^2$		13536.60
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		116.35
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		67.25

WORKSHEET FOR COMPUTING S_M

CONFIDENTIAL-NOT FOR PUBLIC RELEASE

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	HRS	Max. Score	PRO
1 Observed Release	0 45	1	0	45	45
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					
Depth to Aquifer of Concern	0 1 2 3	2	6	6	6
Net Precipitation	0 1 2 3	1	3	3	3
Permeability of the Unsaturated Zone	0 1 2 3	1	3	3	3
Physical State	0 1 2 3	1	3	3	3
Total Route Characteristics Score			15	15	15
3 Containment	0 1 2 3	1	3	3	3
4 Waste Characteristics					
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	18
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	8	8	8
Total Waste Characteristics Score			26	26	26
5 Targets					
Ground Water Use	0 1 2 3	3	6	9	9
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	35	40	40
Total Targets Score			41	49	49
6 If line 1 is 45, multiply 1 x 4 x 5; If line 1 is 0, multiply 2 x 3 x 4 x 5			47970	57,330	57330
7 Divide line 6 by 57,330 and multiply by 100		S_{gw} =	83.67		100

HRS SCORE 0

PRO SCORE □

CONFIDENTIAL-NOT FOR PUBLIC RELEASE

Surface Water Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	HRS	Max. Score	PRO
1 Observed Release	0 45	1	0	45	45
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					
Facility Slope and Intervening Terrain	0 1 2 3	1	2	3	2
1-yr. 24-hr. Rainfall	0 1 2 3	1	2	3	2
Distance to Nearest Surface Water	0 1 2 3	2	6	6	6
Physical State	0 1 2 3	1	3	3	3
Total Route Characteristics Score			13	15	13
3 Containment	0 1 2 3	1	3	3	3
4 Waste Characteristics					
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	18
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	8	8	8
Total Waste Characteristics Score			26	26	26
5 Targets					
Surface Water Use	0 1 2 3	3	6	9	6
Distance to a Sensitive Environment	0 1 2 3	2	0	6	0
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	0	40	0
Total Targets Score			6	55	6
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			6084	64,350	7020
7 Divide line 6 by 64,350 and multiply by 100		S_{sw} =	9.45		10.91

HRS SCORE 0

PRO SCORE □

CONFIDENTIAL-NOT FOR PUBLIC RELEASE

Air Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	HRS	Max. Score	PRO
1 Observed Release	0 $\boxed{45}$	1	0	45	45
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S_a = 0. Enter on line 5 If line 1 is 45, then proceed to line 2					
2 Waste Characteristics					
Reactivity and Incompatibility	0 1 $\boxed{2}$ 3	1		3	2
Toxicity	0 1 2 $\boxed{3}$	3		9	9
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 $\boxed{8}$	1		8	8
Total Waste Characteristics Score				20	19
3 Targets					
Population Within 4-Mile Radius	0 9 12 15 18 $\boxed{21}$ 24 27 30	1		30	21
Distance to Sensitive Environment	$\boxed{0}$ 1 2 3	2		6	0
Land Use	0 1 2 $\boxed{3}$	1		3	3
Total Targets Score				39	24
4 Multiply 1 x 2 x 3				35,100	20520
5 Divide line 4 by 35,100 and multiply by 100		S_a =	0		58.46

HRS SCORE 0

PRO SCORE □

104329

UNITED ST[illegible]S ENVIRONMENTAL PROTECTION AGENCY
REGION II
EDISON, NEW JERSEY 08837

AUG 15 1989

Mr. Michael J. O'Toole, Jr., P.E.
Director
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233

Dear Mr. O'Toole:

This is in reply to your April 14, 1989, request for a CERCLA removal action at the Li Tungsten Site in Glen Cove, Nassau County, New York. Mr. Charles Fitzsimmons, of the Response and Prevention Branch, was assigned as the On-Scene Coordinator (OSC) for this site.

A preliminary assessment and removal site inspection was conducted on April 16, 1989, and also April 26 through April 28, 1989. Based on the findings of this inspection, we determined that there is a substantial threat of release of hazardous substances as described under Section 104 of CERCLA, as amended by SARA. As a result of this determination, negotiations were initiated between the Primary Responsible Party (Old Court Savings and Loan) and EPA's Office of Regional Counsel. On June 30, 1989, an agreement was reached.

This Consent Order requires the responsible party to remove all hazardous substances as regulated by CERCLA, RCRA and the CWA. The large quantity of slag material bearing above background levels of select radionuclides will have to be addressed under the State's remedial program. The responsible party will provide a short term mitigative fix by stabilizing these piles.

104330

Should you have any questions or require additional information, please have your staff contact Mr. Fitzsimmons at (201) 321-6608.

Sincerely yours,

Steph D. Lufty

Stephen D. Luftig, Director
Emergency and Remedial Response Division

cc: R. Salkie, 2ERR-ADREPP
B. Sprague, 2ERR-RPB
C. Fitzsimmons, 2ERR-RPB

OFFICE OF THE MAYOR
CITY OF GLEN COVE
NEW YORK 11542

DONALD P. DeRIGGI
MAYOR AND SUPERVISOR

516-676-2000

FEB 2 1990

January 31, 1990

RE: Glen Cove - LiTungsten Site

Gentlemen:

In April of 1989, anhydrous ammonia and other volatile chemicals were found at the above location, together with 32 million pounds of slag containing thorium and other radioactive elements.

The EPA is finishing its emergency removal of the laboratory chemicals, asbestos, PCBs and other elements it has deemed to be part of its mandate. Remaining will be the 32 million pounds of thorium slag. Our concern is that the radioactive elements should be included in the emergency removal plan or should at least be characterized by the DEC as requiring high priority on its removal list.

The Li Tungsten site is located next to Glen Cove Creek which empties into Hempstead Harbor. The 32 million pounds of thorium poses a serious leachate question. Run-off and seepage seem inevitable. It should also be noted that our fire department has expressed great concern about having to enter onto the premises. They have been advised that if there is a fire, or if indeed there are aggravated wind conditions at the location, the radioactive particles will become volatilized and airborne and, therefore, possibly ingested. The EPA has indicated that most of the radioactive elements are being stored within buildings on the premises. These buildings are wooden and in a dilapidated condition. Therefore, the chance of fire is real and the volatilization of the particles is a very serious question.

I, therefore, respectfully request your assistance in securing the removal of the radioactive substances by having this aspect incorporated into the emergency removal plan of EPA or, in the alternative if this is not possible, having Li Tungsten characterized as having high priority on the DEC's list of sites.

Very truly yours

DONALD P. DE RIGGI
Mayor and Supervisor

DPD:dag

FEB 7 1990

Mr. Michael J. O'Toole, Jr., P.E.
Director
Division of Hazardous Waste Remediation
New York State Department of Environmental
Conservation
50 Wolf Road
Albany, New York 12233

Dear Mr. O'Toole:

This is in regard to the Li Tungsten, Glen Cove, Long Island time critical removal action presently being performed by the Responsible Party under a Section 106 Order on Consent. As you are aware, field activities have been ongoing since this agreement was reached on June 30, 1989, as described in my letter to you dated August 15, 1989 (attached).

A great deal of site stabilization and clean-up activity has taken place since the initiation of the removal action. However, it is anticipated that the removal action, as described in the above order, will come to a conclusion on or about February 10, 1990. Shortly thereafter, a final report from the Responsible Party should be completed and submitted to EPA. As you are also aware this site is not listed on the National Priorities List (NPL) and nomination for such may not occur until sometime in 1991, after the new EPA hazard ranking system is finalized.

Mr. Charles Fitzsimmons, On-Scene Coordinator of my staff, would like to coordinate a meeting with members of your staff to effect a smooth transition of overall site leadership. This meeting would also serve to provide an update on the present site conditions, specifically with regard to the large quantity of radioactive slag material, that remains on-site.

Dick Salkie or Mr. Fitzsimmons will be contacting Al Rochmore to arrange this discussion. Should you have additional questions on this transition, please contact Mr. Fitzsimmons at 201-321-6608 or myself.

Sincerely yours,

Stephen D. Luftig

Stephen D. Luftig, Director
Emergency and Remedial Response Division

cc: R. Salkie, 2ERR-ADREPP
B. Sprague, 2ERR-RPB
C. Fitzsimmons, 2ERR-RPB
J. Doyle, ORC-NYCSUP
M. Hauptman, ERRD-SC
A. Hess, ERRD-SC
A. Fellman, AWM-RAD

Left on site

final report just received by EPA

16,000+ tons - piles and drums

low level RAD facility

High level - was removed - not immediately dangerous

DOH STAT . OF NEW YOR.
DEPARTMENT OF HEALTH
Corning Tower The Governor Nelson A. Rockefeller Empire State Plaza . Albany, New York 12237

David Axelrod, M.D.
Commissioner

OFFICE OF PUBLIC HEALTH
Linda A. Randolph, M.D., M.P.H.
Director
William F. Leavy
Executive Deputy Director

March 9, 1990

Mr. Michael J. O'Toole, Jr. P.E., Director
Division of Hazardous Waste Remediation
NYS Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. O'Toole:

We recently received a copy of a letter dated February 7, 1990 to you from Stephen Luftig of EPA relative to the Li Tungsten site in Glen Cove, NY. In the letter, EPA asked for a meeting to effect a transition of overall site leadership.

We would like to be included in any such meeting due to the concerns about the large quantities of radioactive materials on this site. Please contact me or William Condon at 458-6461 if you have any questions.

Sincerely,

Karim Rimawi

Karim Rimawi, Ph.D.
Director
Bureau of Environmental Radiation Protection

cc: Dr. Hetling
Dr. Merges
Mr. Condon

RECEIVED
MAR 12 1990
DIVISION OF HAZARDOUS WASTE REMEDIATION

104336

B. Conetta

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233 7010

JUN 4 1990

Thomas C. Jorling
Commissioner

Mr. Stephen Luftig
Director
Emergency and Remedial Response Division
USEPA Region II
26 Federal Plaza
New York, New York 10278

Dear Mr. Luftig:

Re: Site Code #130046
Li Tungsten, Glen Cove
Nassau County

Thank you for your expert assistance as lead agency during the recent PRP remedial efforts at the referenced site. This is yet another example of how EPA's timely response and cooperation are helping to clean up and remediate sites, such as this, to the benefit of all.

As you are aware, radioactive contamination is not a hazardous waste in New York State and the New York State Department of Environmental Conservation (NYSDEC), therefore, cannot use State Superfund money to address the problem of the remaining radioactive slag. This site is a Class 2 site on our registry (significant threat to public health or environment) due to other contaminants. It is not scheduled in our program in the immediate future.

The enclosed letter from the City of Glen Cove Mayor and Supervisor, Mr. Donald Riggi, explains the grave concern of the residents of Glen Cove regarding the Li Tungsten site. The NYSDEC, therefore, requests that the USEPA remain as lead agency at the site until such time as the problem of the radioactive contaminated slag is solved.

If you have any questions regarding this request, please contact Alan Rockmore, P.E., of my staff at (518) 457-9280.

Sincerely,

for Charles N. Goddard

Michael J. O'Toole, Jr., P.E.
Director
Division of Hazardous Waste Remediation

Enclosure
cc: R. Tramontano - NYSDOH
K. Rimawi - NYSDOH
R. Salkie - USEPA Region II

FILE COPY
FILE COPY

Mr. Donald P. De Riggi
Mayor and Supervisor
Glen Cove, New York 11542

Dear Mayor De Riggi:

In reference to your January 14, 1991 letter concerning the placement of the Li Tungsten site on EPA's National Priorities List (NPL) of Superfund sites, please be advised that the next NPL update (Update #11) is scheduled to be released by EPA-Headquarters, Washington, D.C., in the Spring of 1991.

As you know, candidates for Update #11 include the Li Tungsten site; moreover, the final selection of NPL sites from the candidate list will be announced at the time Update #11 is released.

If I may be of further assistance, please let me know. I can be reached at (212) 264-0522.

Sincerely yours,

Edward G. Als, Remedial Project Manager
Eastern New York/Caribbean Section I

bcc: D. Santella

104338